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LEVEL III

Report No. CG-D-41-78

A058737
VOL I

(12)

PERSONAL FLOTATION DEVICES RESEARCH - PHASE II

VOLUME 3 - APPENDICES

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Wyle Laboratories
7800 Governors Drive, West
Huntsville, AL 35807

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16. Abstract

Appendices to the technical report on Personal Flotation Devices (PFD) research are presented. These appendices contain additional wearability/accessibility data crosstabulations, three technical briefs on PFD reliability research, three appendices to the Accident Recovery Model, and an appendix to the cost/benefit analysis of LSI implementation alternatives.

Volume 1 of this three volume report is an Executive Summary and Proposed Technical Approach. Volume 2 is the technical report of the research program.

17. Key Words Life-Saving Index, Personal Flotation Devices, Wearability, Accessibility, Effectiveness, Reliability, Accident Recovery Model, Accelerated Aging, Flotation Dummy, Life Jackets, Life Preservers	**18. Distribution Statement** Document is available to the U.S. public through the National Technical Information Service, Springfield, Virginia 22161

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VOLUME 3 - APPENDICES

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METRIC CONVERSION FACTORS

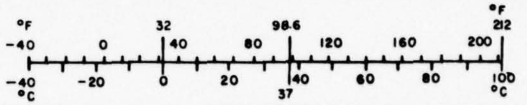
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

inches
1
2
3
4
5
6
7
8
9
cm
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.

③ 4X

③ 4X

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SECTION III - APPENDICES

DEVELOPMENT OF A TEST METHOD AND MODEL FOR PFD WEARABILITY AND ACCESSIBILITY

- APPENDIX III-A Variable Definitions and Codes
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  - Crosstabulation with NV 1
  - Crosstabulation with V 29
  - Crosstabulation with NV 5
  - Crosstabulation with NV 15
  - Crosstabulation with NV 16
  - Crosstabulation with NV 8

⑦ 8X

7/8X

APPENDIX III-A. VARIABLE DEFINITIONS AND CODES

NV 1 Proportion of time candidate PFD was worn.

Code	NV 1
1	>0.75
2	0.50 to 0.75
3	0.10 to 0.50
4	0.01 to 0.10
5	$\leq$ 0.01

V 29 Reported customary rate of PFD wear (proportion of time)

Codes same as NV 1

NV 5 Proportion of time candidate PFD was accessible or worn.

Codes same as NV 1

NV 15 Unadjusted wearability factor score (F_W)

Code	F_W
0	$\leq$-2.75
1	-2.75 to -1.56
2	-1.56 to -0.36
3	-0.36 to 0.83
4	0.83 to 2.03
5	2.03 to 3.22
6	3.22 to 4.41
7	>4.41

NV 16 Unadjusted accessibility factor score (F_A)

Code	F_A
2	$\leq$-4.53
4	-4.53 to -2.54
6	-2.54 to -0.56
8	-0.56 to 1.43
10	>1.43

NV 8 Kind of PFDs tested - placed in one of five categories:

1. Throwables and devices intended for emergency wear only.
2. Wearable devices which are bulky and unattractive.
3. Yoke or collar type inflatable devices.
4. Vests and jackets.
5. Belt-type devices.

⑨ ⑨

NV 9-NV 14 Boaters' attitudes*

Code	NV 9, ..., NV 14
1	0 to 0.333
2	0.334 to 0.666
3	0.667 to 1.0

NV 6 Boating Safety Education

Code	NV 6
0	None
1	Completed 1 or more courses

Codes for boating activities (V 54 to V 64)

Code	Meaning
1	Engaged in the activity shown
2	Did not engage in the activity

*

Attitude Dimension	Designation and Method of Computation
Positive about keeping PFDs accessible	NV9 = 1/10(V30 + V38 - 2)
Positive about wearing PFD in rough conditions	NV10 = 1/20(V31 + V35 + V41 - V45 + 3)
Believes PFDs are highly effective and reliable	NV11 = 1/15(V32 - V37 - V42 + 11)
Believes he/she needs a PFD in the water	NV12 = 1/20(V33 - V44 - V46 + V52 + 10)
Image (feels positive about wearing a PFD and others who wear PFDs)	NV13 = 1/40(V34 - V36 + V39 - V40 + V48 - V49 - V50 - V51 + 27)
Positive about wearing PFDs	NV14 = 1/10(V47 - V43 + 5)

APPENDIX III-B

Wearability/Accessibility Study Crosstabulations

Crosstabulation with NV 1

(11)

(11)
12X

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WEARABILITY DATA ANALYSIS                                                                          12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )   DOLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV9       ATTITUDE ON ACESS                                     BY  NV1
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                         NV1
               COUNT  I
               ROW PCT I                                                   ROW
               COL PCT I                                                   TOTAL
               TOT PCT I      1.I       2.I       3.I       4.I       5.I
NV9            --------I--------I--------I--------I--------I--------I
                    1. I      0  I      1  I      5  I      3  I      3  I      12
                       I      0  I    8.3  I   41.7  I   25.0  I   25.0  I     6.9
                       I      0  I   11.1  I    6.9  I   12.5  I   10.7  I
                       I      0  I     .6  I    2.9  I    1.7  I    1.7  I
                      -I--------I--------I--------I--------I--------I
                    2. I      8  I      2  I     15  I      6  I      6  I      37
                       I   21.6  I    5.4  I   40.5  I   16.2  I   16.2  I    21.1
                       I   19.0  I   22.2  I   20.8  I   25.0  I   21.4  I
                       I    4.6  I    1.1  I    8.6  I    3.4  I    3.4  I
                      -I--------I--------I--------I--------I--------I
                    3. I     34  I      6  I     52  I     15  I     19  I     126
                       I   27.0  I    4.8  I   41.3  I   11.9  I   15.1  I    72.0
                       I   81.0  I   66.7  I   72.2  I   62.5  I   67.9  I
                       I   19.4  I    3.4  I   29.7  I    8.6  I   10.9  I
                      -I--------I--------I--------I--------I--------I
               COLUMN        42         9        72        24        28        175
                TOTAL      24.0       5.1      41.1      13.7      16.0      100.0

RAW CHI SQUARE =      5.97681 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .6498
CRAMER#S V =      .13068
CONTINGENCY COEFFICIENT =      .18173

NUMBER OF MISSING OBSERVATIONS =        4
```

(13)

(13)

```
WEARABILITY DATA ANALYSIS                                                        12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )   COLL PFD

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * *
   NV10     ATTWEAR ROUGH CD                                     BY  NV1
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    NV1
             COUNT  I   HIGH                                  LOW
           ROW PCT  I   WEAR                                  WEAR     ROW
           COL PCT  I                                                  TOTAL
           TOT PCT  I       1.I       2.I       3.I       4.I       5.I
NV10        --------I---------I---------I---------I---------I---------I
                2.  I     0   I     1   I     3   I     5   I     1   I     10
                    I     0   I  10.0   I  30.0   I  50.0   I  10.0   I    5.7
                    I     0   I  11.1   I   4.2   I  20.8   I   3.6   I
                    I     0   I    .6   I   1.7   I   2.9   I    .6   I
                   -I---------I---------I---------I---------I---------I
                3.  I    42   I     8   I    69   I    19   I    27   I    165
                    I  25.5   I   4.8   I  41.8   I  11.5   I  16.4   I   94.3
                    I 100.0   I  88.9   I  95.8   I  79.2   I  96.4   I
                    I  24.0   I   4.6   I  39.4   I  10.9   I  15.4   I
                   -I---------I---------I---------I---------I---------I
            COLUMN       42         9        72        24        28       175
             TOTAL     24.0       5.1      41.1      13.7      16.0     100.0

RAW CHI SQUARE =     13.77315 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0081
CRAMER#S V =      .28054
CONTINGENCY COEFFICIENT =      .27011

NUMBER OF MISSING OBSERVATIONS =       4
```

```
WEARABILITY DATA ANALYSIS                                                                12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )    COLL PFD

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV11      ATTIT ON EFF-REL                                        BY  NV1
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

               NV1
        COUNT  I
      ROW PCT  I                                                      ROW
      COL PCT  I                                                     TOTAL
      TOT PCT  I      1.I       2.I       3.I       4.I       5.I
NV11   --------I--------I--------I--------I--------I--------I
           1.  I      4  I      1  I     18  I     12  I      7  I     42
               I    9.5  I    2.4  I   42.9  I   28.6  I   16.7  I   24.9
               I    9.5  I   12.5  I   26.9  I   50.0  I   25.0  I
               I    2.4  I     .6  I   10.7  I    7.1  I    4.1  I
              -I--------I--------I--------I--------I--------I
           2.  I     34  I      6  I     46  I     11  I     20  I    117
               I   29.1  I    5.1  I   39.3  I    9.4  I   17.1  I   69.2
               I   81.0  I   75.0  I   68.7  I   45.8  I   71.4  I
               I   20.1  I    3.6  I   27.2  I    6.5  I   11.8  I
              -I--------I--------I--------I--------I--------I
           3.  I      4  I      1  I      3  I      1  I      1  I     10
               I   40.0  I   10.0  I   30.0  I   10.0  I   10.0  I    5.9
               I    9.5  I   12.5  I    4.5  I    4.2  I    3.6  I
               I    2.4  I     .6  I    1.8  I     .6  I     .6  I
              -I--------I--------I--------I--------I--------I
       COLUMN        42         8        67        24        28       169
        TOTAL      24.9       4.7      39.6      14.2      16.6     100.0

RAW CHI SQUARE =     15.59980 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0485
CRAMER#S V =      .21483
CONTINGENCY COEFFICIENT =      .29070

NUMBER OF MISSING OBSERVATIONS =        10
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WEARABILITY DATA ANALYSIS                                                        12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )   DOLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV12     NEED FOR PFD                                          BY  NV1
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                  NV1
         COUNT  I
         ROW PCT I                                                     ROW
         COL PCT I                                                    TOTAL
         TOT PCT I       1.I       2.I       3.I       4.I       5.I
NV12     --------I--------I--------I--------I--------I--------I
              1.  I       2 I       1 I       4 I       4 I       1 I    12
                 I   16.7 I     8.3 I    33.3 I    33.3 I     8.3 I   6.9
                 I    4.8 I    11.1 I     5.6 I    16.7 I     3.6 I
                 I    1.1 I      .6 I     2.3 I     2.3 I      .6 I
                -I--------I--------I--------I--------I--------I
              2.  I      18 I       3 I      30 I      13 I       9 I    73
                 I   24.7 I     4.1 I    41.1 I    17.8 I    12.3 I  41.7
                 I   42.9 I    33.3 I    41.7 I    54.2 I    32.1 I
                 I   10.3 I     1.7 I    17.1 I     7.4 I     5.1 I
                -I--------I--------I--------I--------I--------I
              3.  I      22 I       5 I      38 I       7 I      18 I    90
                 I   24.4 I     5.6 I    42.2 I     7.8 I    20.0 I  51.4
                 I   52.4 I    55.6 I    52.8 I    29.2 I    64.3 I
                 I   12.6 I     2.9 I    21.7 I     4.0 I    10.3 I
                -I--------I--------I--------I--------I--------I
         COLUMN        42         9        72        24        28     175
          TOTAL      24.0       5.1      41.1      13.7      16.0   100.0

RAW CHI SQUARE =     9.44032 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3065
CRAMER#S V =     .16423
CONTINGENCY COEFFICIENT =     .22624

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                        12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )    COLL PFD

* * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * *
    NV13      IMAGE                                           BY  NV1
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                   NV1
             COUNT I
           ROW PCT I                                                   ROW
           COL PCT I                                                  TOTAL
           TOT PCT I      1.I       2.I       3.I       4.I       5.I
NV13       --------I--------I--------I--------I--------I--------I
               1.  I     4  I     1  I     9  I     4  I     1  I     19
                   I  21.1  I   5.3  I  47.4  I  21.1  I   5.3  I   11.7
                   I  10.3  I  11.1  I  13.8  I  16.7  I   3.8  I
                   I   2.5  I    .6  I   5.5  I   2.5  I    .6  I
                  -I--------I--------I--------I--------I--------I
               2.  I    29  I     8  I    49  I    16  I    21  I    123
                   I  23.6  I   6.5  I  39.8  I  13.0  I  17.1  I   75.5
                   I  74.4  I  88.9  I  75.4  I  66.7  I  80.8  I
                   I  17.8  I   4.9  I  30.1  I   9.8  I  12.9  I
                  -I--------I--------I--------I--------I--------I
               3.  I     6  I     0  I     7  I     4  I     4  I     21
                   I  28.6  I     0  I  33.3  I  19.0  I  19.0  I   12.9
                   I  15.4  I     0  I  10.8  I  16.7  I  15.4  I
                   I   3.7  I     0  I   4.3  I   2.5  I   2.5  I
                  -I--------I--------I--------I--------I--------I
            COLUMN      39         9        65        24        26      163
             TOTAL    23.9       5.5      39.9      14.7      16.0    100.0

RAW CHI SQUARE =      4.74445 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .7845
CRAMER#S V =      .12064
CONTINGENCY COEFFICIENT =      .16818

NUMBER OF MISSING OBSERVATIONS =       16
```

```
WEARABILITY DATA ANALYSIS                                                           12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )   DOLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV14      PFD WEAR                                              BY  NV1
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    NV1
           COUNT  I
         ROW PCT  I                                                        ROW
         COL PCT  I                                                        TOTAL
         TOT PCT  I       1.I       2.I       3.I       4.I       5.I
NV14     --------I--------I--------I--------I--------I--------I
             1.   I      9  I      5  I     34  I     12  I     10  I     70
                  I   12.9  I    7.1  I   48.6  I   17.1  I   14.3  I   41.4
                  I   21.4  I   55.6  I   50.0  I   50.0  I   38.5  I
                  I    5.3  I    3.0  I   20.1  I    7.1  I    5.9  I
                 -I--------I--------I--------I--------I--------I
             2.   I     14  I      4  I     25  I      9  I     11  I     63
                  I   22.2  I    6.3  I   39.7  I   14.3  I   17.5  I   37.3
                  I   33.3  I   44.4  I   36.8  I   37.5  I   42.3  I
                  I    8.3  I    2.4  I   14.8  I    5.3  I    6.5  I
                 -I--------I--------I--------I--------I--------I
             3.   I     19  I      0  I      9  I      3  I      5  I     36
                  I   52.8  I      0  I   25.0  I    8.3  I   13.9  I   21.3
                  I   45.2  I      0  I   13.2  I   12.5  I   19.2  I
                  I   11.2  I      0  I    5.3  I    1.8  I    3.0  I
                 -I--------I--------I--------I--------I--------I
          COLUMN        42         9        68        24        26      169
           TOTAL      24.9       5.3      40.2      14.2      15.4    100.0

RAW CHI SQUARE =     22.87371 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0035
CRAMER#S V =      .26014
CONTINGENCY COEFFICIENT =      .34527

NUMBER OF MISSING OBSERVATIONS =       10
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WEARABILITY DATA ANALYSIS                                                          12/19/77

FILE    TED       (CREATION DATE =  12/19/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
    V3         AGE                                                         BY  NV1
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    NV1
            COUNT  I
          ROW PCT  I    High                                        Low      ROW
          COL PCT  I                                                         TOTAL
          TOT PCT  I      1.I      2.I      3.I      4.I      5.I
V3        --------I--------I--------I--------I--------I--------I
             1.0  I     12  I      1  I      8  I      6  I      1  I     28
                  I   42.9  I    3.6  I   28.6  I   21.4  I    3.6  I   16.7
                  I   29.3  I   12.5  I   11.4  I   25.0  I    4.0  I
                  I    7.1  I     .6  I    4.8  I    3.6  I     .6  I
                 -I--------I--------I--------I--------I--------I
             2.0  I     14  I      2  I     20  I      4  I      6  I     46
                  I   30.4  I    4.3  I   43.5  I    8.7  I   13.0  I   27.4
                  I   34.1  I   25.0  I   28.6  I   16.7  I   24.0  I
                  I    8.3  I    1.2  I   11.9  I    2.4  I    3.6  I
                 -I--------I--------I--------I--------I--------I
             3.0  I      9  I      3  I     10  I      9  I      8  I     39
                  I   23.1  I    7.7  I   25.6  I   23.1  I   20.5  I   23.2
                  I   22.0  I   37.5  I   14.3  I   37.5  I   32.0  I
                  I    5.4  I    1.8  I    6.0  I    5.4  I    4.8  I
                 -I--------I--------I--------I--------I--------I
             4.0  I      4  I      0  I     19  I      4  I      5  I     32
                  I   12.5  I      0  I   59.4  I   12.5  I   15.6  I   19.0
                  I    9.8  I      0  I   27.1  I   16.7  I   20.0  I
                  I    2.4  I      0  I   11.3  I    2.4  I    3.0  I
                 -I--------I--------I--------I--------I--------I
             5.0  I      2  I      2  I     13  I      1  I      5  I     23
                  I    8.7  I    8.7  I   56.5  I    4.3  I   21.7  I   13.7
                  I    4.9  I   25.0  I   18.6  I    4.2  I   20.0  I
                  I    1.2  I    1.2  I    7.7  I     .6  I    3.0  I
                 -I--------I--------I--------I--------I--------I
           COLUMN       41         8        70        24        25       168
            TOTAL     24.4       4.8      41.7      14.3      14.9     100.0

RAW CHI SQUARE =    28.95615 WITH     16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0242
CRAMER#S V =      .20758
CONTINGENCY COEFFICIENT =       .38343

NUMBER OF MISSING OBSERVATIONS =       11
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(19)

(19)

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WEARABILITY DATA ANALYSIS                                                                  01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV1                                                          BY  V4        SEX
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V4
         COUNT   I
        ROW PCT  IMALE     FEMALE      ROW
        COL PCT  I                     TOTAL
        TOT PCT  I     1.0I      2.0I
NV1     --------I--------I--------I
             1.  I    31  I    10  I     41
                 I  75.6  I  24.4  I   23.6
                 I  26.3  I  17.9  I
                 I  17.8  I   5.7  I
                -I--------I--------I
             2.  I     7  I     2  I      9
                 I  77.8  I  22.2  I    5.2
                 I   5.9  I   3.6  I
                 I   4.0  I   1.1  I
                -I--------I--------I
             3.  I    46  I    26  I     72
                 I  63.9  I  36.1  I   41.4
                 I  39.0  I  46.4  I
                 I  26.4  I  14.9  I
                -I--------I--------I
             4.  I    19  I     5  I     24
                 I  79.2  I  20.8  I   13.8
                 I  16.1  I   8.9  I
                 I  10.9  I   2.9  I
                -I--------I--------I
             5.  I    15  I    13  I     28
                 I  53.6  I  46.4  I   16.1
                 I  12.7  I  23.2  I
                 I   8.6  I   7.5  I
                -I--------I--------I
         COLUMN      118       56       174
          TOTAL     67.8     32.2     100.0

RAW CHI SQUARE =      6.07880 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1933
CRAMER*S V =      .18691
CONTINGENCY COEFFICIENT =      .18373

NUMBER OF MISSING OBSERVATIONS =        5
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WEARABILITY DATA ANALYSIS                                                              01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
    NV1                                                              BY  NV6      BOATING SAFETY EDUCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                       NV6
                                        COMPLETED 1 OR
             COUNT  I                   MORE COURSES
             ROW PCT I   NONE                          ROW
             COL PCT I                                 TOTAL
             TOT PCT I             0I          1.I
NV1          --------I---------I---------I
                  1.  I     26  I     16  I       42
      >.75            I   61.9  I   38.1  I     24.0
                      I   47.3  I   13.3  I
                      I   14.9  I    9.1  I
                     -I---------I---------I
                  2.  I      3  I      6  I        9
                      I   33.3  I   66.7  I      5.1
                      I    5.5  I    5.0  I
     .50 - .75        I    1.7  I    3.4  I
                     -I---------I---------I
                  3.  I     12  I     60  I       72
                      I   16.7  I   83.3  I     41.1
     .10 - .50        I   21.8  I   50.0  I
                      I    6.9  I   34.3  I
                     -I---------I---------I
                  4.  I      8  I     16  I       24
                      I   33.3  I   66.7  I     13.7
     .01 - .10        I   14.5  I   13.3  I
                      I    4.6  I    9.1  I
                     -I---------I---------I
                  5.  I      6  I     22  I       28
                      I   21.4  I   78.6  I     16.0
      ≤.01            I   10.9  I   18.3  I
                      I    3.4  I   12.6  I
                     -I---------I---------I
             COLUMN         55        120        175
              TOTAL       31.4       68.6      100.0

RAW CHI SQUARE =     26.73611 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER#S V =       .39087
CONTINGENCY COEFFICIENT =       .36405

NUMBER OF MISSING OBSERVATIONS =        4
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PROPORTION OF TIME CANDIDATE PFD WAS WORN

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WEARABILITY DATA ANALYSIS                                                                          01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    LOLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV1                                                                    BY  V11         BOAT EXPER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V11
            COUNT   I
            ROW PCT I20-100    100-500  GREATER     ROW
            COL PCT I                   THEN 500   TOTAL
            TOT PCT I      2.0I      3.0I      4.0I
NV1         --------I---------I---------I---------I
               1.   I     6   I     6   I    30   I     42
                    I  14.3   I  14.3   I  71.4   I   24.0
                    I  85.7   I  25.0   I  20.8   I
                    I   3.4   I   3.4   I  17.1   I
                   -I---------I---------I---------I
               2.   I     1   I     0   I     8   I      9
                    I  11.1   I     0   I  88.9   I    5.1
                    I  14.3   I     0   I   5.6   I
                    I    .6   I     0   I   4.6   I
                   -I---------I---------I---------I
               3.   I     0   I     8   I    64   I     72
                    I     0   I  11.1   I  88.9   I   41.1
                    I     0   I  33.3   I  44.4   I
                    I     0   I   4.6   I  36.6   I
                   -I---------I---------I---------I
               4.   I     0   I     3   I    21   I     24
                    I     0   I  12.5   I  87.5   I   13.7
                    I     0   I  12.5   I  14.6   I
                    I     0   I   1.7   I  12.0   I
                   -I---------I---------I---------I
               5.   I     0   I     7   I    21   I     28
                    I     0   I  25.0   I  75.0   I   16.0
                    I     0   I  29.2   I  14.6   I
                    I     0   I   4.0   I  12.0   I
                   -I---------I---------I---------I
            COLUMN          7        24       144      175
             TOTAL        4.0      13.7      82.3    100.0

RAW CHI SQUARE =     22.72342 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0037
CRAMER#S V =      .25480
CONTINGENCY COEFFICIENT =       .33901

NUMBER OF MISSING OBSERVATIONS =        4
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WEARABILITY DATA ANALYSIS                                                                         01/09/78

FILE . TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
    NV1                                                                BY  V12       LOCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                        V12
                 COUNT  I
                ROW PCT IRIVER,CR SMALL LA WATERWAY OCEAN        ROW
                COL PCT IEEK,ETC  KE       ,BAY,ETC              TOTAL
                TOT PCT I     1.0I     2.0I     4.0I     5.0I
NV1             --------I--------I--------I--------I--------I
                     1. I      1 I     12 I      7 I     22 I      42
                        I    2.4 I   28.6 I   16.7 I   52.4 I    24.7
                        I  100.0 I   66.7 I   24.1 I   18.0 I
                        I     .6 I    7.1 I    4.1 I   12.9 I
                       -I--------I--------I--------I--------I
                     2. I      0 I      0 I      2 I      6 I       8
                        I      0 I      0 I   25.0 I   75.0 I     4.7
                        I      0 I      0 I    6.9 I    4.9 I
                        I      0 I      0 I    1.2 I    3.5 I
                       -I--------I--------I--------I--------I
                     3. I      0 I      5 I     11 I     54 I      70
                        I      0 I    7.1 I   15.7 I   77.1 I    41.2
                        I      0 I   27.8 I   37.9 I   44.3 I
                        I      0 I    2.9 I    6.5 I   31.8 I
                       -I--------I--------I--------I--------I
                     4. I      0 I      0 I      5 I     18 I      23
                        I      0 I      0 I   21.7 I   78.3 I    13.5
                        I      0 I      0 I   17.2 I   14.8 I
                        I      0 I      0 I    2.9 I   10.6 I
                       -I--------I--------I--------I--------I
                     5. I      0 I      1 I      4 I     22 I      27
                        I      0 I    3.7 I   14.8 I   81.5 I    15.9
                        I      0 I    5.6 I   13.8 I   18.0 I
                        I      0 I     .6 I    2.4 I   12.9 I
                       -I--------I--------I--------I--------I
                 COLUMN        1       18       29      122       170
                  TOTAL       .6     10.6     17.1     71.8     100.0

RAW CHI SQUARE =     24.88335 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0154
CRAMER*S V =      .22089
CONTINGENCY COEFFICIENT =      .35733

NUMBER OF MISSING OBSERVATIONS =        9
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23

23

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WEARABILITY DATA ANALYSIS                                                                        01/09/78

FILE    TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * *
    NV1                                                          BY  V13         BOAT TYPE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V13
         COUNT   I
         ROW PCT ICANOE     OTHER     SAIL      CPEN POW CABIN MO  ROW
         COL PCT I                              ER       TORBOAT   TOTAL
         TOT PCT I     1.0I      3.0I      4.0I      6.0I      7.0I
NV1      --------I--------I--------I--------I--------I--------I
            1.   I    12  I     1  I     2  I    22  I     5  I    42
                 I  28.6  I   2.4  I   4.8  I  52.4  I  11.9  I  24.4
                 I  66.7  I 100.0  I   4.5  I  36.7  I  10.2  I
                 I   7.0  I    .6  I   1.2  I  12.8  I   2.9  I
                -I--------I--------I--------I--------I--------I
            2.   I     0  I     0  I     1  I     4  I     4  I     9
                 I     0  I     0  I  11.1  I  44.4  I  44.4  I   5.2
                 I     0  I     0  I   2.3  I   6.7  I   8.2  I
                 I     0  I     0  I    .6  I   2.3  I   2.3  I
                -I--------I--------I--------I--------I--------I
            3.   I     5  I     0  I    21  I    20  I    25  I    71
                 I   7.0  I     0  I  29.6  I  28.2  I  35.2  I  41.3
                 I  27.8  I     0  I  47.7  I  33.3  I  51.0  I
                 I   2.9  I     0  I  12.2  I  11.6  I  14.5  I
                -I--------I--------I--------I--------I--------I
            4.   I     0  I     0  I     8  I     7  I     8  I    23
                 I     0  I     0  I  34.8  I  30.4  I  34.8  I  13.4
                 I     0  I     0  I  18.2  I  11.7  I  16.3  I
                 I     0  I     0  I   4.7  I   4.1  I   4.7  I
                -I--------I--------I--------I--------I--------I
            5.   I     1  I     0  I    12  I     7  I     7  I    27
                 I   3.7  I     0  I  44.4  I  25.9  I  25.9  I  15.7
                 I   5.6  I     0  I  27.3  I  11.7  I  14.3  I
                 I    .6  I     0  I   7.0  I   4.1  I   4.1  I
                -I--------I--------I--------I--------I--------I
         COLUMN      18         1        44        60        49      172
          TOTAL    10.5        .6      25.6      34.9      28.5    100.0

RAW CHI SQUARE =    46.34720 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0001
CRAMER*S V =      .25955
CONTINGENCY COEFFICIENT =       .46072

NUMBER OF MISSING OBSERVATIONS =        7
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WEARABILITY DATA ANALYSIS                                                                        01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
   NV1                                                                        BY  V14        BOAT LENGTH
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

                     V14
             COUNT  I
            ROW PCT ILT 16    16-20     20-26    GT 26       ROW
            COL PCT I                                        TOTAL
            TOT PCT I     1.0I     2.0I     3.0I     4.0I
NV1         --------I--------I--------I--------I--------I
                1.  I     7  I    27  I     1  I     4  I     39
                    I  17.9  I  69.2  I   2.6  I  10.3  I   24.5
                    I  38.9  I  52.9  I   9.1  I   5.1  I
                    I   4.4  I  17.0  I    .6  I   2.5  I
                   -I--------I--------I--------I--------I
                2.  I     0  I     4  I     0  I     5  I      9
                    I     0  I  44.4  I     0  I  55.6  I    5.7
                    I     0  I   7.8  I     0  I   6.3  I
                    I     0  I   2.5  I     0  I   3.1  I
                   -I--------I--------I--------I--------I
                3.  I     4  I    15  I     7  I    39  I     65
                    I   6.2  I  23.1  I  10.8  I  60.0  I   40.9
                    I  22.2  I  29.4  I  63.6  I  49.4  I
                    I   2.5  I   9.4  I   4.4  I  24.5  I
                   -I--------I--------I--------I--------I
                4.  I     2  I     4  I     1  I    14  I     21
                    I   9.5  I  19.0  I   4.8  I  66.7  I   13.2
                    I  11.1  I   7.8  I   9.1  I  17.7  I
                    I   1.3  I   2.5  I    .6  I   8.8  I
                   -I--------I--------I--------I--------I
                5.  I     5  I     1  I     2  I    17  I     25
                    I  20.0  I   4.0  I   8.0  I  68.0  I   15.7
                    I  27.8  I   2.0  I  18.2  I  21.5  I
                    I   3.1  I    .6  I   1.3  I  10.7  I
                   -I--------I--------I--------I--------I
            COLUMN        18       51        11       79       159
             TOTAL      11.3     32.1       6.9     49.7     100.0

RAW CHI SQUARE =     51.73087 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER'S V =       .32932
CONTINGENCY COEFFICIENT =      .49546

NUMBER OF MISSING OBSERVATIONS =       20
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25

25

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WEARABILITY DATA ANALYSIS                                                                              01/09/78

FILE   TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV1                                                              BY  V29       CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

               V29
        COUNT  I
      ROW PCT  I75        50-75     10-50     1-10      NEVER       ROW
      COL PCT  I                                                    TOTAL
      TOT PCT  I     1.0I     2.0I     3.0I     4.0I     5.0I
NV1   ---------I--------I---------I--------I--------I--------I
           1.  I    13  I      5  I     12 I      5 I      7 I     42
               I  31.0  I   11.9  I   28.6 I   11.9 I   16.7 I   24.0
               I  72.2  I   83.3  I   26.1 I   11.4 I   11.5 I
               I   7.4  I    2.9  I    6.9 I    2.9 I    4.0 I
              -I--------I---------I--------I--------I--------I
           2.  I     0  I      0  I      2 I      4 I      3 I      9
               I     0  I      0  I   22.2 I   44.4 I   33.3 I    5.1
               I     0  I      0  I    4.3 I    9.1 I    4.9 I
               I     0  I      0  I    1.1 I    2.3 I    1.7 I
              -I--------I---------I--------I--------I--------I
           3.  I     5  I      0  I     19 I     19 I     29 I     72
               I   6.9  I      0  I   26.4 I   26.4 I   40.3 I   41.1
               I  27.8  I      0  I   41.3 I   43.2 I   47.5 I
               I   2.9  I      0  I   10.9 I   10.9 I   16.6 I
              -I--------I---------I--------I--------I--------I
           4.  I     0  I      0  I      6 I      4 I     14 I     24
               I     0  I      0  I   25.0 I   16.7 I   58.3 I   13.7
               I     0  I      0  I   13.0 I    9.1 I   23.0 I
               I     0  I      0  I    3.4 I    2.3 I    8.0 I
              -I--------I---------I--------I--------I--------I
           5.  I     0  I      1  I      7 I     12 I      8 I     28
               I     0  I    3.6  I   25.0 I   42.9 I   28.6 I   16.0
               I     0  I   16.7  I   15.2 I   27.3 I   13.1 I
               I     0  I     .6  I    4.0 I    6.9 I    4.6 I
              -I--------I---------I--------I--------I--------I
       COLUMN       18        6        46       44       61       175
        TOTAL     10.3      3.4      26.3     25.1     34.9     100.0

RAW CHI SQUARE =     54.26970 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER#S V =      .27844
CONTINGENCY COEFFICIENT =      .48653

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                              01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV1                                                                  BY  V54        FISHING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

                 V54
        COUNT  I
      ROW PCT  I                           ROW
      COL PCT  I                          TOTAL
      TOT PCT  I      1.0I      2.0I
NV1   ---------I---------I---------I
           1.  I     19  I     23  I     42
               I   45.2  I   54.8  I   24.0
               I   38.8  I   18.3  I
               I   10.9  I   13.1  I
              -I---------I---------I
           2.  I      4  I      5  I      9
               I   44.4  I   55.6  I    5.1
               I    8.2  I    4.0  I
               I    2.3  I    2.9  I
              -I---------I---------I
           3.  I     21  I     51  I     72
               I   29.2  I   70.8  I   41.1
               I   42.9  I   40.5  I
               I   12.0  I   29.1  I
              -I---------I---------I
           4.  I      4  I     20  I     24
               I   16.7  I   83.3  I   13.7
               I    8.2  I   15.9  I
               I    2.3  I   11.4  I
              -I---------I---------I
           5.  I      1  I     27  I     28
               I    3.6  I   96.4  I   16.0
               I    2.0  I   21.4  I
               I     .6  I   15.4  I
              -I---------I---------I
       COLUMN        49        126        175
        TOTAL      28.0       72.0      100.0

RAW CHI SQUARE =     17.26387 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0017
CRAMER≠S V =      .31409
CONTINGENCY COEFFICIENT =      .29965

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                                          01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )     COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV1                                                          BY  V55        CANOEING OR KAYAKING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V55
             COUNT  I
            ROW PCT I                    ROW
            COL PCT I                    TOTAL
            TOT PCT I      1.0I      2.0I
NV1         --------I---------I---------I
                1.  I     12  I     30  I     42
                    I   28.6  I   71.4  I   24.0
                    I   75.0  I   18.9  I
                    I    6.9  I   17.1  I
                   -I---------I---------I
                2.  I      0  I      9  I      9
                    I      0  I  100.0  I    5.1
                    I      0  I    5.7  I
                    I      0  I    5.1  I
                   -I---------I---------I
                3.  I      3  I     69  I     72
                    I    4.2  I   95.8  I   41.1
                    I   18.8  I   43.4  I
                    I    1.7  I   39.4  I
                   -I---------I---------I
                4.  I      0  I     24  I     24
                    I      0  I  100.0  I   13.7
                    I      0  I   15.1  I
                    I      0  I   13.7  I
                   -I---------I---------I
                5.  I      1  I     27  I     28
                    I    3.6  I   96.4  I   16.0
                    I    6.3  I   17.0  I
                    I     .6  I   15.4  I
                   -I---------I---------I
             COLUMN       16       159      175
              TOTAL      9.1      90.9    100.0

RAW CHI SQUARE =     25.59822 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER≠S V =      .38246
CONTINGENCY COEFFICIENT =      .35722

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                                  01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV1                                                                   BY  V56       SKINDIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

               V56
        COUNT  I
      ROW PCT  I            ROW
      COL PCT  I           TOTAL
      TOT PCT  I      2.0I
NV1   ---------I---------I
           1.  I     42  I     42
               I  100.0  I   24.0
               I   24.0  I
               I   24.0  I
              -I---------I
           2.  I      9  I      9
               I  100.0  I    5.1
               I    5.1  I
               I    5.1  I
              -I---------I
           3.  I     72  I     72
               I  100.0  I   41.1
               I   41.1  I
               I   41.1  I
              -I---------I
           4.  I     24  I     24
               I  100.0  I   13.7
               I   13.7  I
               I   13.7  I
              -I---------I
           5.  I     28  I     28
               I  100.0  I   16.0
               I   16.0  I
               I   16.0  I
              -I---------I
       COLUMN       175       175
        TOTAL     100.0     100.0

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE    TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NV1                                                          BY  V57         SCUBA DIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V57
            COUNT  I
          ROW PCT  I                    ROW
          COL PCT  I                    TOTAL
          TOT PCT  I     1.0I     2.0I
NV1       ---------I--------I--------I
               1.  I     0  I    42  I     42
                   I     0  I 100.0  I   24.0
                   I     0  I  24.3  I
                   I     0  I  24.0  I
                  -I--------I--------I
               2.  I     0  I     9  I      9
                   I     0  I 100.0  I    5.1
                   I     0  I   5.2  I
                   I     0  I   5.1  I
                  -I--------I--------I
               3.  I     2  I    70  I     72
                   I   2.8  I  97.2  I   41.1
                   I 100.0  I  40.5  I
                   I   1.1  I  40.0  I
                  -I--------I--------I
               4.  I     0  I    24  I     24
                   I     0  I 100.0  I   13.7
                   I     0  I  13.9  I
                   I     0  I  13.7  I
                  -I--------I--------I
               5.  I     0  I    28  I     28
                   I     0  I 100.0  I   16.0
                   I     0  I  16.2  I
                   I     0  I  16.0  I
                  -I--------I--------I
           COLUMN        2      173      175
            TOTAL      1.1     98.9    100.0

RAW CHI SQUARE =      2.89419 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5757
CRAMER≠S V =      .12860
CONTINGENCY COEFFICIENT =      .12755

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                              01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NV1                                                    BY  V58       SWIMMING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                 V58
        COUNT  I
      ROW PCT  I                      ROW
      COL PCT  I                      TOTAL
      TOT PCT  I     1.0I      2.0I
NV1   ---------I--------I---------I
           1.  I     0  I     42  I     42
               I     0  I  100.0  I   24.0
               I     0  I   24.1  I
               I     0  I   24.0  I
              -I--------I---------I
           2.  I     0  I      9  I      9
               I     0  I  100.0  I    5.1
               I     0  I    5.2  I
               I     0  I    5.1  I
              -I--------I---------I
           3.  I     1  I     71  I     72
               I   1.4  I   98.6  I   41.1
               I 100.0  I   40.8  I
               I    .6  I   40.6  I
              -I--------I---------I
           4.  I     0  I     24  I     24
               I     0  I  100.0  I   13.7
               I     0  I   13.8  I
               I     0  I   13.7  I
              -I--------I---------I
           5.  I     0  I     28  I     28
               I     0  I  100.0  I   16.0
               I     0  I   16.1  I
               I     0  I   16.0  I
              -I--------I---------I
       COLUMN        1       174       175
        TOTAL       .6      99.4     100.0

RAW CHI SQUARE =     1.43878 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =   .8374
CRAMER#S V =      .09067
CONTINGENCY COEFFICIENT =      .09030

NUMBER OF MISSING OBSERVATIONS =       4
```

```
WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV1                                                         BY  V59       CAMPING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

                    V59
          COUNT   I
        ROW PCT   I           ROW
        COL PCT   I           TOTAL
        TOT PCT   I      2.01
NV1      ---------I---------I
             1.   I     42  I     42
                  I  100.0  I   24.0
                  I   24.0  I
                  I   24.0  I
                 -I---------I
             2.   I      9  I      9
                  I  100.0  I    5.1
                  I    5.1  I
                  I    5.1  I
                 -I---------I
             3.   I     72  I     72
                  I  100.0  I   41.1
                  I   41.1  I
                  I   41.1  I
                 -I---------I
             4.   I     24  I     24
                  I  100.0  I   13.7
                  I   13.7  I
                  I   13.7  I
                 -I---------I
             5.   I     28  I     28
                  I  100.0  I   16.0
                  I   16.0  I
                  I   16.0  I
                 -I---------I
         COLUMN        175       175
          TOTAL      100.0     100.0

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                                   01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
     NV1                                                                BY  V60        SAILING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                  V60
           COUNT  I
         ROW PCT  I                     ROW
         COL PCT  I                     TOTAL
         TOT PCT  I    1.0I     2.0I
NV1      ---------I--------I--------I
              1.  I     0  I    42  I     42
                  I     0  I 100.0  I   24.0
                  I     0  I  27.1  I
                  I     0  I  24.0  I
                 -I--------I--------I
              2.  I     0  I     9  I      9
                  I     0  I 100.0  I    5.1
                  I     0  I   5.8  I
                  I     0  I   5.1  I
                 -I--------I--------I
              3.  I     5  I    67  I     72
                  I   6.9  I  93.1  I   41.1
                  I  25.0  I  43.2  I
                  I   2.9  I  38.3  I
                 -I--------I--------I
              4.  I    10  I    14  I     24
                  I  41.7  I  58.3  I   13.7
                  I  50.0  I   9.0  I
                  I   5.7  I   8.0  I
                 -I--------I--------I
              5.  I     5  I    23  I     28
                  I  17.9  I  82.1  I   16.0
                  I  25.0  I  14.8  I
                  I   2.9  I  13.1  I
                 -I--------I--------I
           COLUMN      20      155       175
            TOTAL    11.4     88.6     100.0

RAW CHI SQUARE =     30.83277 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0000
CRAMER*S V =      .41975
CONTINGENCY COEFFICIENT =      .38703

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                                                 01/09/78

FILE   TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV1                                                                 BY  V61        WATER SKIING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                   V61
          COUNT  I
        ROW PCT  I                         ROW
        COL PCT  I                         TOTAL
        TOT PCT  I     1.0I      2.0I
NV1     ---------I---------I---------I
             1.  I      0  I     42  I      42
                 I      0  I  100.0  I    24.0
                 I      0  I   24.9  I
                 I      0  I   24.0  I
                -I---------I---------I
             2.  I      0  I      9  I       9
                 I      0  I  100.0  I     5.1
                 I      0  I    5.3  I
                 I      0  I    5.1  I
                -I---------I---------I
             3.  I      6  I     66  I      72
                 I    8.3  I   91.7  I    41.1
                 I  100.0  I   39.1  I
                 I    3.4  I   37.7  I
                -I---------I---------I
             4.  I      0  I     24  I      24
                 I      0  I  100.0  I    13.7
                 I      0  I   14.2  I
                 I      0  I   13.7  I
                -I---------I---------I
             5.  I      0  I     28  I      28
                 I      0  I  100.0  I    16.0
                 I      0  I   16.6  I
                 I      0  I   16.0  I
                -I---------I---------I
         COLUMN         6        169       175
          TOTAL       3.4       96.6     100.0

RAW CHI SQUARE =      8.88807 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0640
CRAMER#S V =      .22536
CONTINGENCY COEFFICIENT =      .21985

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                                         01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
     NV1                                                      BY  V62       PLEASURE CRUISING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    V62
           COUNT   I
         ROW PCT   I                        ROW
         COL PCT   I                        TOTAL
         TOT PCT   I      1.0I      2.0I
NV1      --------I--------I--------I
              1.   I     12   I     30   I     42
                   I   28.6   I   71.4   I   24.0
                   I   14.8   I   31.9   I
                   I    6.9   I   17.1   I
                 -I--------I--------I
              2.   I      5   I      4   I      9
                   I   55.6   I   44.4   I    5.1
                   I    6.2   I    4.3   I
                   I    2.9   I    2.3   I
                 -I--------I--------I
              3.   I     37   I     35   I     72
                   I   51.4   I   48.6   I   41.1
                   I   45.7   I   37.2   I
                   I   21.1   I   20.0   I
                 -I--------I--------I
              4.   I      8   I     16   I     24
                   I   33.3   I   66.7   I   13.7
                   I    9.9   I   17.0   I
                   I    4.6   I    9.1   I
                 -I--------I--------I
              5.   I     19   I      9   I     28
                   I   67.9   I   32.1   I   16.0
                   I   23.5   I    9.6   I
                   I   10.9   I    5.1   I
                 -I--------I--------I
          COLUMN         81         94      175
           TOTAL       46.3       53.7    100.0

RAW CHI SQUARE =      13.22632 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =     .0102
CRAMER#S V =       .27492
CONTINGENCY COEFFICIENT =      .26508

NUMBER OF MISSING OBSERVATIONS =         4
```

```
WEARABILITY DATA ANALYSIS                                                                                    01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV1                                                                      BY  V63       RACING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V63
            COUNT  I
          ROW PCT  I            ROW
          COL PCT  I            TOTAL
          TOT PCT  I      2.0I
NV1       ---------I---------I
              1.   I     42  I     42
                   I  100.0  I   24.0
                   I   24.0  I
                   I   24.0  I
                  -I---------I
              2.   I      9  I      9
                   I  100.0  I    5.1
                   I    5.1  I
                   I    5.1  I
                  -I---------I
              3.   I     72  I     72
                   I  100.0  I   41.1
                   I   41.1  I
                   I   41.1  I
                  -I---------I
              4.   I     24  I     24
                   I  100.0  I   13.7
                   I   13.7  I
                   I   13.7  I
                  -I---------I
              5.   I     28  I     28
                   I  100.0  I   16.0
                   I   16.0  I
                   I   16.0  I
                  -I---------I
           COLUMN       175       175
            TOTAL     100.0     100.0

NUMBER OF MISSING OBSERVATIONS =       4
```

```
WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV1                                                          BY  V64       HUNTING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V64
              COUNT  I
            ROW PCT  I             ROW
            COL PCT  I             TOTAL
            TOT PCT  I      2.0I
NV1         --------I--------I
                1.   I      42  I      42
                     I  100.0  I    24.0
                     I   24.0  I
                     I   24.0  I
                    -I--------I
                2.   I       9  I       9
                     I  100.0  I     5.1
                     I    5.1  I
                     I    5.1  I
                    -I--------I
                3.   I      72  I      72
                     I  100.0  I    41.1
                     I   41.1  I
                     I   41.1  I
                    -I--------I
                4.   I      24  I      24
                     I  100.0  I    13.7
                     I   13.7  I
                     I   13.7  I
                    -I--------I
                5.   I      28  I      28
                     I  100.0  I    16.0
                     I   16.0  I
                     I   16.0  I
                    -I--------I
             COLUMN       175        175
              TOTAL     100.0      100.0

NUMBER OF MISSING OBSERVATIONS =       4
```

```
WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV1                                                               BY  V66        WATER CONDITIONS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                  V66
         COUNT   I
         ROW PCT ICALM      CHOPPY    ROUGH OR   ROW
         COL PCT I                    WHITE      TOTAL
         TOT PCT I     1.0I      2.0I      3.0I
NV1      --------I---------I---------I---------I
              1. I    13   I    19   I    10   I    42
                 I  31.0   I  45.2   I  23.8   I  24.0
                 I  23.6   I  19.8   I  41.7   I
                 I   7.4   I  10.9   I   5.7   I
                -I---------I---------I---------I
              2. I     3   I     5   I     1   I     9
                 I  33.3   I  55.6   I  11.1   I   5.1
                 I   5.5   I   5.2   I   4.2   I
                 I   1.7   I   2.9   I    .6   I
                -I---------I---------I---------I
              3. I    21   I    44   I     7   I    72
                 I  29.2   I  61.1   I   9.7   I  41.1
                 I  38.2   I  45.8   I  29.2   I
                 I  12.0   I  25.1   I   4.0   I
                -I---------I---------I---------I
              4. I    12   I     8   I     4   I    24
                 I  50.0   I  33.3   I  16.7   I  13.7
                 I  21.8   I   8.3   I  16.7   I
                 I   6.9   I   4.6   I   2.3   I
                -I---------I---------I---------I
              5. I     6   I    20   I     2   I    28
                 I  21.4   I  71.4   I   7.1   I  16.0
                 I  10.9   I  20.8   I   8.3   I
                 I   3.4   I  11.4   I   1.1   I
                -I---------I---------I---------I
          COLUMN      55        96        24       175
           TOTAL    31.4      54.9      13.7     100.0

RAW CHI SQUARE =     13.34280 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1006
CRAMER#S V =     .19525
CONTINGENCY COEFFICIENT =     .26616

NUMBER OF MISSING OBSERVATIONS =        4
```

```
WEARABILITY DATA ANALYSIS                                                        01/09/78

FILE    TFD       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV1                                                   BY  V67        AIR TEMPERATURE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    V67
           COUNT   I
          ROW PCT  I40 OR L  51-60     61-70     71-80     81-90       ROW
          COL PCT  I                                                   TOTAL
          TOT PCT  I     1.0I      3.0I      4.0I      5.0I      6.0I
NV1       ---------I---------I---------I---------I---------I---------I
              1.   I     0   I     2   I    16   I    21   I     3   I     42
                   I     0   I   4.8   I  38.1   I  50.0   I   7.1   I   24.0
                   I     0   I  50.0   I  21.1   I  25.9   I  33.3   I
                   I     0   I   1.1   I   9.1   I  12.0   I   1.7   I
                  -I---------I---------I---------I---------I---------I
              2.   I     0   I     0   I     6   I     3   I     0   I      9
                   I     0   I     0   I  66.7   I  33.3   I     0   I    5.1
                   I     0   I     0   I   7.9   I   3.7   I     0   I
                   I     0   I     0   I   3.4   I   1.7   I     0   I
                  -I---------I---------I---------I---------I---------I
              3.   I     1   I     2   I    28   I    36   I     5   I     72
                   I   1.4   I   2.8   I  38.9   I  50.0   I   6.9   I   41.1
                   I  20.0   I  50.0   I  36.8   I  44.4   I  55.6   I
                   I    .6   I   1.1   I  16.0   I  20.6   I   2.9   I
                  -I---------I---------I---------I---------I---------I
              4.   I     1   I     0   I    11   I    11   I     1   I     24
                   I   4.2   I     0   I  45.8   I  45.8   I   4.2   I   13.7
                   I  20.0   I     0   I  14.5   I  13.6   I  11.1   I
                   I    .6   I     0   I   6.3   I   6.3   I    .6   I
                  -I---------I---------I---------I---------I---------I
              5.   I     3   I     0   I    15   I    10   I     0   I     28
                   I  10.7   I     0   I  53.6   I  35.7   I     0   I   16.0
                   I  60.0   I     0   I  19.7   I  12.3   I     0   I
                   I   1.7   I     0   I   8.6   I   5.7   I     0   I
                  -I---------I---------I---------I---------I---------I
            COLUMN       5         4        76        81         9      175
             TOTAL     2.9       2.3      43.4      46.3       5.1    100.0

RAW CHI SQUARE =      17.29427 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3668
CRAMER#S V =       .15718
CONTINGENCY COEFFICIENT =       .29989

NUMBER OF MISSING OBSERVATIONS =         4
```

```
WEARABILITY DATA ANALYSIS                                                                     01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV1                                                                BY  V68       WEATHER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                  V68
         COUNT   I
         ROW PCT ISUNNY    CLOUDY      ROW
         COL PCT I                    TOTAL
         TOT PCT I     1.0I     2.0I
NV1      --------I--------I--------I
            1.   I    28  I    14  I    42
                 I  66.7  I  33.3  I  24.3
                 I  20.9  I  35.9  I
                 I  16.2  I   8.1  I
                -I--------I--------I
            2.   I     6  I     3  I     9
                 I  66.7  I  33.3  I   5.2
                 I   4.5  I   7.7  I
                 I   3.5  I   1.7  I
                -I--------I--------I
            3.   I    58  I    13  I    71
                 I  81.7  I  18.3  I  41.0
                 I  43.3  I  33.3  I
                 I  33.5  I   7.5  I
                -I--------I--------I
            4.   I    19  I     4  I    23
                 I  82.6  I  17.4  I  13.3
                 I  14.2  I  10.3  I
                 I  11.0  I   2.3  I
                -I--------I--------I
            5.   I    23  I     5  I    28
                 I  82.1  I  17.9  I  16.2
                 I  17.2  I  12.8  I
                 I  13.3  I   2.9  I
                -I--------I--------I
         COLUMN      134       39       173
          TOTAL     77.5     22.5     100.0

RAW CHI SQUARE =     4.83096 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =   .3051
CRAMER*S V =      .16711
CONTINGENCY COEFFICIENT =      .16482

NUMBER OF MISSING OBSERVATIONS =        6
```

40

40

```
WEARABILITY DATA ANALYSIS                                                                                01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV1                                                                         BY  V69        WIND
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V69
           COUNT   I
          ROW PCT  ICALM     MODERATE STRONG       ROW
          COL PCT  I                              TOTAL
          TOT PCT  I     1.0I     2.0I     3.0I
NV1       ---------I--------I--------I--------I
               1.  I    17  I    21  I     1  I    39
                   I  43.6  I  53.8  I   2.6  I  25.7
                   I  37.0  I  21.4  I  12.5  I
                   I  11.2  I  13.8  I    .7  I
                  -I--------I--------I--------I
               2.  I     2  I     3  I     1  I     6
                   I  33.3  I  50.0  I  16.7  I   3.9
                   I   4.3  I   3.1  I  12.5  I
                   I   1.3  I   2.0  I    .7  I
                  -I--------I--------I--------I
               3.  I    14  I    44  I     4  I    62
                   I  22.6  I  71.0  I   6.5  I  40.8
                   I  30.4  I  44.9  I  50.0  I
                   I   9.2  I  28.9  I   2.6  I
                  -I--------I--------I--------I
               4.  I     9  I    10  I     0  I    19
                   I  47.4  I  52.6  I     0  I  12.5
                   I  19.6  I  10.2  I     0  I
                   I   5.9  I   6.6  I     0  I
                  -I--------I--------I--------I
               5.  I     4  I    20  I     2  I    26
                   I  15.4  I  76.9  I   7.7  I  17.1
                   I   8.7  I  20.4  I  25.0  I
                   I   2.6  I  13.2  I   1.3  I
                  -I--------I--------I--------I
           COLUMN       46       98        8     152
            TOTAL     30.3     64.5      5.3   100.0

RAW CHI SQUARE =     13.05749 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1099
CRAMERS V =      .20725
CONTINGENCY COEFFICIENT =      .28126

NUMBER OF MISSING OBSERVATIONS =       27
```

APPENDIX III-B

Wearability/Accessibility Study Crosstabulations

Crosstabulations with V 29

```
WEARABILITY DATA ANALYSIS                                                                    12/19/77

FILE    TED       (CREATION DATE =  12/19/77 )    DOLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * *
    NV9       ATTITUDE ON ACESS                                BY  V29        CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V29
            COUNT  I
          ROW PCT  I75        50-75    10-50    1-10      NEVER        ROW
          COL PCT  I                                                  TOTAL
          TOT PCT  I      1.0I     2.0I     3.0I     4.0I     5.0I
NV9       --------I--------I--------I--------I--------I--------I
               1.  I     0  I     0  I     6  I     0  I     6  I      12
                   I     0  I     0  I  50.0  I     0  I  50.0  I     6.7
                   I     0  I     0  I  12.8  I     0  I   9.8  I
                   I     0  I     0  I   3.4  I     0  I   3.4  I
                  -I--------I--------I--------I--------I--------I
               2.  I     6  I     0  I     5  I     6  I    20  I      37
                   I  16.2  I     0  I  13.5  I  16.2  I  54.1  I    20.7
                   I  33.3  I     0  I  10.6  I  12.8  I  32.8  I
                   I   3.4  I     0  I   2.8  I   3.4  I  11.2  I
                  -I--------I--------I--------I--------I--------I
               3.  I    12  I     6  I    36  I    41  I    35  I     130
                   I   9.2  I   4.6  I  27.7  I  31.5  I  26.9  I    72.6
                   I  66.7  I 100.0  I  76.6  I  87.2  I  57.4  I
                   I   6.7  I   3.4  I  20.1  I  22.9  I  19.6  I
                  -I--------I--------I--------I--------I--------I
           COLUMN        18        6       47       47       61       179
            TOTAL      10.1      3.4     26.3     26.3     34.1     100.0

RAW CHI SQUARE =     23.05005 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0033
CRAMER#S V =      .25374
CONTINGENCY COEFFICIENT =       .33776
```

```
WEARABILITY DATA ANALYSIS                                                                          12/19/77

FILE    TED       (CREATION DATE =  12/19/77 )    DOLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
   NV10       ATTWEAR ROUGH CD                                         BY  V29        CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                     V29
             COUNT  I
           ROW PCT  I75        50-75    10-50     1-10      NEVER        ROW
           COL PCT  I                                                    TOTAL
           TOT PCT  I     1.0I     2.0I     3.0I     4.0I     5.0I
NV10       ---------I--------I--------I--------I--------I--------I
               2.   I      0 I      0 I      0 I      0 I     10 I     10
                    I      0 I      0 I      0 I      0 I  100.0 I    5.6
                    I      0 I      0 I      0 I      0 I   16.4 I
                    I      0 I      0 I      0 I      0 I    5.6 I
                   -I--------I--------I--------I--------I--------I
               3.   I     18 I      6 I     47 I     47 I     51 I    169
                    I   10.7 I    3.6 I   27.8 I   27.8 I   30.2 I   94.4
                    I  100.0 I  100.0 I  100.0 I  100.0 I   83.6 I
                    I   10.1 I    3.4 I   26.3 I   26.3 I   28.5 I
                   -I--------I--------I--------I--------I--------I
            COLUMN        18        6       47       47       61      179
             TOTAL      10.1      3.4     26.3     26.3     34.1    100.0

RAW CHI SQUARE =     20.48889 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0004
CRAMER≠S V =      .33832
CONTINGENCY COEFFICIENT =       .32048
```

```
WEARABILITY DATA ANALYSIS                                                              12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * *
    NV11      ATTIT ON EFF-REL                                     BY  V29       CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V29
          COUNT  I
        ROW PCT  I75       50-75     10-50     1-10      NEVER       ROW
        COL PCT  I                                                    TOTAL
        TOT PCT  I     1.0I      2.0I      3.0I      4.0I      5.0I
NV11     --------I--------I--------I--------I--------I--------I
             1.  I     0  I     0  I    17  I    12  I    13  I     42
                 I     0  I     0  I  40.5  I  28.6  I  31.0  I   24.3
                 I     0  I     0  I  36.2  I  28.6  I  21.7  I
                 I     0  I     0  I   9.8  I   6.9  I   7.5  I
                -I--------I--------I--------I--------I--------I
             2.  I    18  I     6  I    30  I    30  I    37  I    121
                 I  14.9  I   5.0  I  24.8  I  24.8  I  30.6  I   69.9
                 I 100.0  I 100.0  I  63.8  I  71.4  I  61.7  I
                 I  10.4  I   3.5  I  17.3  I  17.3  I  21.4  I
                -I--------I--------I--------I--------I--------I
             3.  I     0  I     0  I     0  I     0  I    10  I     10
                 I     0  I     0  I     0  I     0  I 100.0  I    5.8
                 I     0  I     0  I     0  I     0  I  16.7  I
                 I     0  I     0  I     0  I     0  I   5.8  I
                -I--------I--------I--------I--------I--------I
         COLUMN       18        6        47        42        60       173
          TOTAL     10.4      3.5      27.2      24.3      34.7     100.0

RAW CHI SQUARE =    31.83753 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0001
CRAMER#S V =       .30334
CONTINGENCY COEFFICIENT =      .39424

NUMBER OF MISSING OBSERVATIONS =        6
```

47

```
WEARABILITY DATA ANALYSIS                                                                        12/19/77

FILE   TED       (CREATION DATE =  12/19/77 )   DOLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * *
   NV12      NEED FOR PFD                                         BY  V29       CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V29
           COUNT  I
         ROW PCT  I75         50-75     10-50     1-10      NEVER      ROW
         COL PCT  I                                                    TOTAL
         TOT PCT  I     1.0I      2.0I      3.0I      4.0I      5.0I
NV12     --------I--------I--------I--------I--------I--------I
              1.  I     0  I      0  I      5  I      1  I      6  I     12
                  I     0  I      0  I   41.7  I    8.3  I   50.0  I    6.7
                  I     0  I      0  I   10.6  I    2.1  I    9.8  I
                  I     0  I      0  I    2.8  I     .6  I    3.4  I
                 -I--------I--------I--------I--------I--------I
              2.  I    13  I      0  I     18  I     23  I     23  I     77
                  I  16.9  I      0  I   23.4  I   29.9  I   29.9  I   43.0
                  I  72.2  I      0  I   38.3  I   48.9  I   37.7  I
                  I   7.3  I      0  I   10.1  I   12.8  I   12.8  I
                 -I--------I--------I--------I--------I--------I
              3.  I     5  I      6  I     24  I     23  I     32  I     90
                  I   5.6  I    6.7  I   26.7  I   25.6  I   35.6  I   50.3
                  I  27.8  I  100.0  I   51.1  I   48.9  I   52.5  I
                  I   2.8  I.   3.4  I   13.4  I   12.8  I   17.9  I
                 -I--------I--------I--------I--------I--------I
          COLUMN       18        6         47        47        61       179
           TOTAL     10.1      3.4       26.3      26.3      34.1     100.0

RAW CHI SQUARE =    17.07442 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0293
CRAMER#S V =     .21839
CONTINGENCY COEFFICIENT =     .29510
```

```
WEARABILITY DATA ANALYSIS                                                            12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )    DOLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV13      IMAGE                                           BY  V29       CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V29
           COUNT  I
         ROW PCT  I75       50-75     10-50     1-10      NEVER       ROW
         COL PCT  I                                                   TOTAL
         TOT PCT  I    1.0I     2.0I     3.0I      4.0I      5.0I
NV13     ---------I--------I--------I--------I---------I--------I
              1.  I     0  I     0  I     6  I      0  I    13  I    19
                  I     0  I     0  I  31.6  I      0  I  68.4  I  11.4
                  I     0  I     0  I  14.6  I      0  I  21.3  I
                  I     0  I     0  I   3.6  I      0  I   7.8  I
                 -I--------I--------I--------I---------I--------I
              2.  I     6  I     6  I    23  I     47  I    45  I   127
                  I   4.7  I   4.7  I  18.1  I   37.0  I  35.4  I  76.0
                  I  50.0  I 100.0  I  56.1  I  100.0  I  73.8  I
                  I   3.6  I   3.6  I  13.8  I   28.1  I  26.9  I
                 -I--------I--------I--------I---------I--------I
              3.  I     6  I     0  I    12  I      0  I     3  I    21
                  I  28.6  I     0  I  57.1  I      0  I  14.3  I  12.6
                  I  50.0  I     0  I  29.3  I      0  I   4.9  I
                  I   3.6  I     0  I   7.2  I      0  I   1.8  I
                 -I--------I--------I--------I---------I--------I
          COLUMN       12         6        41        47        61       167
           TOTAL      7.2       3.6      24.6      28.1      36.5     100.0

RAW CHI SQUARE =     52.28589 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER#S V =      .39566
CONTINGENCY COEFFICIENT =      .48830

NUMBER OF MISSING OBSERVATIONS =       12
```

```
WEARABILITY DATA ANALYSIS                                                           12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )   DOLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * *
    NV14      PFD WEAR                                         BY  V29        CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                V29
         COUNT  I
       ROW PCT I75        50-75     10-50     1-10      NEVER       ROW
       COL PCT  I                                                   TOTAL
       TOT PCT  I    1.0I     2.0I     3.0I     4.0I     5.0I
NV14   --------I--------I--------I--------I--------I--------I
            1.  I     0  I     0  I     0  I    18  I    55  I     73
                I     0  I     0  I     0  I  24.7  I  75.3  I   42.2
                I     0  I     0  I     0  I  38.3  I  90.2  I
                I     0  I     0  I     0  I  10.4  I  31.8  I
               -I--------I--------I--------I--------I--------I
            2.  I     0  I     0  I    29  I    29  I     6  I     64
                I     0  I     0  I  45.3  I  45.3  I   9.4  I   37.0
                I     0  I     0  I  70.7  I  61.7  I   9.8  I
                I     0  I     0  I  16.8  I  16.8  I   3.5  I
               -I--------I--------I--------I--------I--------I
            3.  I    18  I     6  I    12  I     0  I     0  I     36
                I  50.0  I  16.7  I  33.3  I     0  I     0  I   20.8
                I 100.0  I 100.0  I  29.3  I     0  I     0  I
                I  10.4  I   3.5  I   6.9  I     0  I     0  I
               -I--------I--------I--------I--------I--------I
        COLUMN       18        6       41       47       61       173
         TOTAL     10.4      3.5     23.7     27.2     35.3     100.0

RAW CHI SQUARE =   198.48120 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =       0
CRAMER#S V =      .75739
CONTINGENCY COEFFICIENT =      .73096

NUMBER OF MISSING OBSERVATIONS =        6
```

```
WEARABILITY DATA ANALYSIS                                                          12/19/77

FILE   TED      (CREATION DATE =  12/19/77 )   DOLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * *
    V3        AGE                                                   BY  V29      CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                 V29
         COUNT  I
       ROW PCT I75       50-75     10-50     1-10      NEVER       ROW
       COL PCT I                                                  TOTAL
       TOT PCT I    1.0I     2.0I     3.0I     4.0I     5.0I
V3     --------I--------I--------I--------I--------I--------I
           1.0 I     6  I     0  I     6  I     1  I    16  I     29
               I  20.7  I     0  I  20.7  I   3.4  I  55.2  I   16.9
               I  33.3  I     0  I  12.8  I   2.4  I  26.7  I
               I   3.5  I     0  I   3.5  I    .6  I   9.3  I
              -I--------I--------I--------I--------I--------I
           2.0 I    12  I     0  I    23  I     6  I     5  I     46
               I  26.1  I     0  I  50.0  I  13.0  I  10.9  I   26.7
               I  66.7  I     0  I  48.9  I  14.6  I   8.3  I
               I   7.0  I     0  I  13.4  I   3.5  I   2.9  I
              -I--------I--------I--------I--------I--------I
           3.0 I     0  I     6  I    18  I     5  I    10  I     39
               I     0  I  15.4  I  46.2  I  12.8  I  25.6  I   22.7
               I     0  I 100.0  I  38.3  I  12.2  I  16.7  I
               I     0  I   3.5  I  10.5  I   2.9  I   5.8  I
              -I--------I--------I--------I--------I--------I
           4.0 I     0  I     0  I     0  I    17  I    18  I     35
               I     0  I     0  I     0  I  48.6  I  51.4  I   20.3
               I     0  I     0  I     0  I  41.5  I  30.0  I
               I     0  I     0  I     0  I   9.9  I  10.5  I
              -I--------I--------I--------I--------I--------I
           5.0 I     0  I     0  I     0  I    12  I    11  I     23
               I     0  I     0  I     0  I  52.2  I  47.8  I   13.4
               I     0  I     0  I     0  I  29.3  I  18.3  I
               I     0  I     0  I     0  I   7.0  I   6.4  I
              -I--------I--------I--------I--------I--------I
        COLUMN      18         6        47        41        60       172
         TOTAL    10.5       3.5      27.3      23.8      34.9     100.0

RAW CHI SQUARE =    116.12156 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER#S V =      .41083
CONTINGENCY COEFFICIENT =      .63485

NUMBER OF MISSING OBSERVATIONS =        7
```

```
WEARABILITY DATA ANALYSIS                                                          01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    V29        CUSTOMRY PFD WEAR                                   BY  V4          SEX
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                          V4
              COUNT    I
            ROW PCT  IMALE      FEMALE      ROW
            COL PCT  I                     TOTAL
            TOT PCT  I      1.0I      2.0I
V29         ---------I---------I---------I
                1.0  I     7   I    11   I    18
  75                 I  38.9   I  61.1   I  10.1
                     I   5.7   I  19.6   I
                     I   3.9   I   6.2   I
                    -I---------I---------I
                2.0  I     6   I     0   I     6
  50-75              I 100.0   I     0   I   3.4
                     I   4.9   I     0   I
                     I   3.4   I     0   I
                    -I---------I---------I
                3.0  I    36   I    11   I    47
  10-50              I  76.6   I  23.4   I  26.4
                     I  29.5   I  19.6   I
                     I  20.2   I   6.2   I
                    -I---------I---------I
                4.0  I    30   I    17   I    47
  1-10               I  63.8   I  36.2   I  26.4
                     I  24.6   I  30.4   I
                     I  16.9   I   9.6   I
                    -I---------I---------I
                5.0  I    43   I    17   I    60
  NEVER              I  71.7   I  28.3   I  33.7
                     I  35.2   I  30.4   I
                     I  24.2   I   9.6   I
                    -I---------I---------I
             COLUMN      122       56       178
              TOTAL     68.5     31.5     100.0

RAW CHI SQUARE =     12.26325 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0155
CRAMER#S V =      .26248
CONTINGENCY COEFFICIENT =      .25388

NUMBER OF MISSING OBSERVATIONS =        1
```

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WEARABILITY DATA ANALYSIS                                                                     01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   V29       CUSTOMRY PFD WEAR                                       BY  NV6
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      NV6
             COUNT  I
            ROW PCT I                     ROW
            COL PCT I                     TOTAL
            TOT PCT I       0I       1.I
V29         --------I--------I--------I
               1.0  I    12  I     6  I     18
  75                I  66.7  I  33.3  I   10.1
                    I  21.4  I   4.9  I
                    I   6.7  I   3.4  I
                   -I--------I--------I
               2.0  I     6  I     0  I      6
  50-75             I 100.0  I     0  I    3.4
                    I  10.7  I     0  I
                    I   3.4  I     0  I
                   -I--------I--------I
               3.0  I    12  I    35  I     47
  10-50             I  25.5  I  74.5  I   26.3
                    I  21.4  I  28.5  I
                    I   6.7  I  19.6  I
                   -I--------I--------I
               4.0  I     7  I    40  I     47
  1-10              I  14.9  I  85.1  I   26.3
                    I  12.5  I  32.5  I
                    I   3.9  I  22.3  I
                   -I--------I--------I
               5.0  I    19  I    42  I     61
  NEVER             I  31.1  I  68.9  I   34.1
                    I  33.9  I  34.1  I
                    I  10.6  I  23.5  I
                   -I--------I--------I
            COLUMN      56      123      179
            TOTAL     31.3     68.7    100.0

RAW CHI SQUARE =     30.25876 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER#S V =      .41115
CONTINGENCY COEFFICIENT =      .38026
```

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WEARABILITY DATA ANALYSIS                                                                        01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   V29        CUSTOMRY PFD WEAR                                         BY  V11        BOAT EXPER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V11
            COUNT   I
            ROW PCT I20-100    100-500  GREATER    ROW
            COL PCT I                   THEN 500  TOTAL
            TOT PCT I     2.0I     3.0I     4.0I
V29         --------I--------I--------I--------I
              1.0   I     5  I     1  I    12  I    18
  75                I  27.8  I   5.6  I  66.7  I  10.1
                    I  71.4  I   4.2  I   8.1  I
                    I   2.8  I    .6  I   6.7  I
                   -I--------I--------I--------I
              2.0   I     0  I     0  I     6  I     6
  50-75             I     0  I     0  I 100.0  I   3.4
                    I     0  I     0  I   4.1  I
                    I     0  I     0  I   3.4  I
                   -I--------I--------I--------I
              3.0   I     0  I    12  I    35  I    47
  10-50             I     0  I  25.5  I  74.5  I  26.3
                    I     0  I  50.0  I  23.6  I
                    I     0  I   6.7  I  19.6  I
                   -I--------I--------I--------I
              4.0   I     0  I     7  I    40  I    47
  1-10              I     0  I  14.9  I  85.1  I  26.3
                    I     0  I  29.2  I  27.0  I
                    I     0  I   3.9  I  22.3  I
                   -I--------I--------I--------I
              5.0   I     2  I     4  I    55  I    61
  NEVER             I   3.3  I   6.6  I  90.2  I  34.1
                    I  28.6  I  16.7  I  37.2  I
                    I   1.1  I   2.2  I  30.7  I
                   -I--------I--------I--------I
           COLUMN         7       24      148      179
            TOTAL       3.9     13.4     82.7    100.0

RAW CHI SQUARE =    40.79606 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0000
CRAMER#S V =      .33757
CONTINGENCY COEFFICIENT =     .43082
```

(54)

54

(38)

38

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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )     COLL PFD

* * * * * * * * * * * * * * * * * * * *    C R O S S T A B U L A T I O N    O F  * * * * * * * * * * * * * * * * * *
     V29          CUSTOMRY PFD WEAR                                BY  V12         LOCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V12
           COUNT  I
         ROW PCT  IRIVER,CR SMALL LA WATERWAY OCEAN        ROW
         COL PCT  IEEK,ETC  KE       ,BAY,ETC              TOTAL
         TOT PCT  I     1.0I     2.0I     4.0I     5.0I
V29      --------I--------I--------I--------I--------I
              1.0 I     1  I     6  I     0  I    11  I     18
  75              I   5.6  I  33.3  I     0  I  61.1  I   10.3
                  I 100.0  I  33.3  I     0  I   8.7  I
                  I    .6  I   3.4  I     0  I   6.3  I
                 -I--------I--------I--------I--------I
              2.0 I     0  I     6  I     0  I     0  I      6
  50-75           I     0  I 100.0  I     0  I     0  I    3.4
                  I     0  I  33.3  I     0  I     0  I
                  I     0  I   3.4  I     0  I     0  I
                 -I--------I--------I--------I--------I
              3.0 I     0  I     6  I     0  I    41  I     47
  10-50           I     0  I  12.8  I     0  I  87.2  I   27.0
                  I     0  I  33.3  I     0  I  32.5  I
                  I     0  I   3.4  I     0  I  23.6  I
                 -I--------I--------I--------I--------I
              4.0 I     0  I     0  I     7  I    35  I     42
  1-10            I     0  I     0  I  16.7  I  83.3  I   24.1
                  I     0  I     0  I  24.1  I  27.8  I
                  I     0  I     0  I   4.0  I  20.1  I
                 -I--------I--------I--------I--------I
              5.0 I     0  I     0  I    22  I    39  I     61
  NEVER           I     0  I     0  I  36.1  I  63.9  I   35.1
                  I     0  I     0  I  75.9  I  31.0  I
                  I     0  I     0  I  12.6  I  22.4  I
                 -I--------I--------I--------I--------I
           COLUMN        1       18       29      126      174
            TOTAL       .6     10.3     16.7     72.4    100.0

RAW CHI SQUARE =    108.39600 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0000
CRAMER*S V =       .45569
CONTINGENCY COEFFICIENT =      .61955

NUMBER OF MISSING OBSERVATIONS =        5
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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   V29        CUSTOMRY PFD WEAR                                    BY  V13        BOAT TYPE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V13
           COUNT   I
          ROW PCT  ICANOE     OTHER     SAIL      OPEN POW CABIN MO   ROW
          COL PCT  I                              ER       TORBOAT    TOTAL
          TOT PCT  I    1.0I     3.0I     4.0I     6.0I     7.0I
V29       ---------I--------I--------I--------I--------I--------I
              1.0  I     6  I     1  I     0  I    11  I     0  I    18
  75               I  33.3  I   5.6  I     0  I  61.1  I     0  I  10.2
                   I  33.3  I 100.0  I     0  I  18.0  I     0  I
                   I   3.4  I    .6  I     0  I   6.3  I     0  I
                  -I--------I--------I--------I--------I--------I
              2.0  I     6  I     0  I     0  I     0  I     0  I     6
  50-75            I 100.0  I     0  I     0  I     0  I     0  I   3.4
                   I  33.3  I     0  I     0  I     0  I     0  I
                   I   3.4  I     0  I     0  I     0  I     0  I
                  -I--------I--------I--------I--------I--------I
              3.0  I     6  I     0  I    11  I    30  I     0  I    47
  10-50            I  12.8  I     0  I  23.4  I  63.8  I     0  I  26.7
                   I  33.3  I     0  I  25.0  I  49.2  I     0  I
                   I   3.4  I     0  I   6.3  I  17.0  I     0  I
                  -I--------I--------I--------I--------I--------I
              4.0  I     0  I     0  I    13  I     6  I    28  I    47
  1-10             I     0  I     0  I  27.7  I  12.8  I  59.6  I  26.7
                   I     0  I     0  I  29.5  I   9.8  I  53.8  I
                   I     0  I     0  I   7.4  I   3.4  I  15.9  I
                  -I--------I--------I--------I--------I--------I
              5.0  I     0  I     0  I    20  I    14  I    24  I    58
  NEVER            I     0  I     0  I  34.5  I  24.1  I  41.4  I  33.0
                   I     0  I     0  I  45.5  I  23.0  I  46.2  I
                   I     0  I     0  I  11.4  I   8.0  I  13.6  I
                  -I--------I--------I--------I--------I--------I
           COLUMN       18         1        44        61        52      176
            TOTAL     10.2        .6      25.0      34.7      29.5    100.0

RAW CHI SQUARE =   148.43219 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER#S V =      .45917
CONTINGENCY COEFFICIENT =      .67640

NUMBER OF MISSING OBSERVATIONS =        3
```

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WEARABILITY DATA ANALYSIS                                                                01/09/78

FILE    TED         (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   V29        CUSTOMRY PFD WEAR                                   BY  V14       BOAT LENGTH
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V14
               COUNT  I
             ROW PCT  ILT 16     16-20     20-26     GT 26      ROW
             COL PCT  I                                         TOTAL
             TOT PCT  I     1.0I     2.0I     3.0I     4.0I
V29           --------I--------I--------I--------I--------I
                 1.0  I     0  I    17  I     0  I     1  I     18
  75                  I     0  I  94.4  I     0  I   5.6  I   11.2
                      I     0  I  32.7  I     0  I   1.3  I
                      I     0  I  10.6  I     0  I    .6  I
                     -I--------I--------I--------I--------I
                 2.0  I     6  I     0  I     0  I     0  I      6
 50-75                I 100.0  I     0  I     0  I     0  I    3.7
                      I  33.3  I     0  I     0  I     0  I
                      I   3.7  I     0  I     0  I     0  I
                     -I--------I--------I--------I--------I
                 3.0  I    12  I    18  I    11  I     6  I     47
 10-50                I  25.5  I  38.3  I  23.4  I  12.8  I   29.4
                      I  66.7  I  34.6  I 100.0  I   7.6  I
                      I   7.5  I  11.2  I   6.9  I   3.7  I
                     -I--------I--------I--------I--------I
                 4.0  I     0  I     6  I     0  I    34  I     40
 1-10                 I     0  I  15.0  I     0  I  85.0  I   25.0
                      I     0  I  11.5  I     0  I  43.0  I
                      I     0  I   3.7  I     0  I  21.2  I
                     -I--------I--------I--------I--------I
                 5.0  I     0  I    11  I     0  I    38  I     49
 NEVER                I     0  I  22.4  I     0  I  77.6  I   30.6
                      I     0  I  21.2  I     0  I  48.1  I
                      I     0  I   6.9  I     0  I  23.8  I
                     -I--------I--------I--------I--------I
              COLUMN       18       52        11       79      160
               TOTAL     11.2     32.5       6.9     49.4    100.0

RAW CHI SQUARE =    158.87468 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER#S V =      .57532
CONTINGENCY COEFFICIENT =      .70586

NUMBER OF MISSING OBSERVATIONS =      19
```

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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE   TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   V29        CUSTOMARY PFD WEAR                                        BY  V54        FISHING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                       V54
              COUNT   I
              ROW PCT I                      ROW
              COL PCT I                      TOTAL
              TOT PCT I     1.0I      2.0I
V29           --------I--------I--------I
                  1.0 I     12 I      6 I     18
  75                  I   66.7 I   33.3 I   10.1
                      I   24.0 I    4.7 I
                      I    6.7 I    3.4 I
                     -I--------I--------I
                  2.0 I      6 I      0 I      6
  50-75               I  100.0 I      0 I    3.4
                      I   12.0 I      0 I
                      I    3.4 I      0 I
                     -I--------I--------I
                  3.0 I     16 I     31 I     47
  10-50               I   34.0 I   66.0 I   26.3
                      I   32.0 I   24.0 I
                      I    8.9 I   17.3 I
                     -I--------I--------I
                  4.0 I      8 I     39 I     47
  1-10                I   17.0 I   83.0 I   26.3
                      I   16.0 I   30.2 I
                      I    4.5 I   21.8 I
                     -I--------I--------I
                  5.0 I      8 I     53 I     61
  NEVER               I   13.1 I   86.9 I   34.1
                      I   16.0 I   41.1 I
                      I    4.5 I   29.6 I
                     -I--------I--------I
              COLUMN        50      129      179
              TOTAL       27.9     72.1    100.0

RAW CHI SQUARE =     39.20035 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER#S V =      .46797
CONTINGENCY COEFFICIENT =      .42385
```

```
WEARABILITY DATA ANALYSIS                                                                           01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * *
   V29        CUSTOMRY PFD WEAR                                    BY  V55        CANOEING OR KAYAKING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                         V55
               COUNT   I
               ROW PCT I                       ROW
               COL PCT I                       TOTAL
               TOT PCT I       1.0I      2.0I
V29            --------I--------I--------I
                  1.0  I      6  I     12  I      18
  75                   I   33.3  I   66.7  I    10.1
                       I   37.5  I    7.4  I
                       I    3.4  I    6.7  I
                      -I--------I--------I
                  2.0  I      6  I      0  I       6
 50-75                 I  100.0  I      0  I     3.4
                       I   37.5  I      0  I
                       I    3.4  I      0  I
                      -I--------I--------I
                  3.0  I      4  I     43  I      47
  10-50                I    8.5  I   91.5  I    26.3
                       I   25.0  I   26.4  I
                       I    2.2  I   24.0  I
                      -I--------I--------I
                  4.0  I      0  I     47  I      47
  1-10                 I      0  I  100.0  I    26.3
                       I      0  I   28.8  I
                       I      0  I   26.3  I
                      -I--------I--------I
                  5.0  I      0  I     61  I      61
  NEVER                I      0  I  100.0  I    34.1
                       I      0  I   37.4  I
                       I      0  I   34.1  I
                      -I--------I--------I
               COLUMN        16       163        179
               TOTAL        8.9      91.1      100.0

RAW CHI SQUARE =    84.89708 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0000
CRAMER≠S V =      .68868
CONTINGENCY COEFFICIENT =      .56719
```

```
WEARABILITY DATA ANALYSIS                                                                        01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    V29        CUSTOMRY PFD WEAR                                        BY  V56        SKINDIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V56
          COUNT   I
          ROW PCT I              ROW
          COL PCT I              TOTAL
          TOT PCT I      2.0I
V29       --------I---------I
              1.0 I     18  I      18
  75              I  100.0  I    10.1
                  I   10.1  I
                  I   10.1  I
                 -I---------I
              2.0 I      6  I       6
  50-75           I  100.0  I     3.4
                  I    3.4  I
                  I    3.4  I
                 -I---------I
              3.0 I     47  I      47
  10-50           I  100.0  I    26.3
                  I   26.3  I
                  I   26.3  I
                 -I---------I
              4.0 I     47  I      47
  1-10            I  100.0  I    26.3
                  I   26.3  I
                  I   26.3  I
                 -I---------I
              5.0 I     61  I      61
  NEVER           I  100.0  I    34.1
                  I   34.1  I
                  I   34.1  I
                 -I---------I
           COLUMN      179         179
           TOTAL     100.0       100.0
```

```
WEARABILITY DATA ANALYSIS                                                                  01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   V29       CUSTOMRY PFD WEAR                                            BY  V57       SCUBA DIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V57
             COUNT   I
             ROW PCT I                          ROW
             COL PCT I                          TOTAL
             TOT PCT I       1.0I      2.0I
V29          --------I---------I---------I
                 1.0 I       0 I      18 I       18
  75                 I       0 I   100.0 I     10.1
                     I       0 I    10.2 I
                     I       0 I    10.1 I
                    -I---------I---------I
                 2.0 I       0 I       6 I        6
  50-75              I       0 I   100.0 I      3.4
                     I       0 I     3.4 I
                     I       0 I     3.4 I
                    -I---------I---------I
                 3.0 I       0 I      47 I       47
  10-50              I       0 I   100.0 I     26.3
                     I       0 I    26.6 I
                     I       0 I    26.3 I
                    -I---------I---------I
                 4.0 I       0 I      47 I       47
  1-10               I       0 I   100.0 I     26.3
                     I       0 I    26.6 I
                     I       0 I    26.3 I
                    -I---------I---------I
                 5.0 I       2 I      59 I       61
  NEVER              I     3.3 I    96.7 I     34.1
                     I   100.0 I    33.3 I
                     I     1.1 I    33.0 I
                    -I---------I---------I
              COLUMN         2       177       179
               TOTAL       1.1      98.9     100.0

RAW CHI SQUARE =      3.91257 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .4180
CRAMER#S V =      .14784
CONTINGENCY COEFFICIENT =      .14625
```

```
WEARABILITY DATA ANALYSIS                                                                      01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    V29       CUSTOMRY PFD WEAR                                   BY  V58       SWIMMING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V58
             COUNT  I
           ROW PCT  I                      ROW
           COL PCT  I                      TOTAL
           TOT PCT  I     1.0I     2.0I
V29        ---------I--------I--------I
               1.0  I      0 I     18 I      18
  75                I      0 I  100.0 I    10.1
                    I      0 I   10.1 I
                    I      0 I   10.1 I
                   -I--------I--------I
               2.0  I      0 I      6 I       6
  50-75             I      0 I  100.0 I     3.4
                    I      0 I    3.4 I
                    I      0 I    3.4 I
                   -I--------I--------I
               3.0  I      1 I     46 I      47
  10-50             I    2.1 I   97.9 I    26.3
                    I  100.0 I   25.8 I
                    I     .6 I   25.7 I
                   -I--------I--------I
               4.0  I      0 I     47 I      47
  1-10              I      0 I  100.0 I    26.3
                    I      0 I   26.4 I
                    I      0 I   26.3 I
                   -I--------I--------I
               5.0  I      0 I     61 I      61
  NEVER             I      0 I  100.0 I    34.1
                    I      0 I   34.3 I
                    I      0 I   34.1 I
                   -I--------I--------I
            COLUMN         1      178       179
             TOTAL        .6     99.4     100.0

RAW CHI SQUARE =     2.82429 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5876
CRAMER#S V =      .12561
CONTINGENCY COEFFICIENT =      .12463
```

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WEARABILITY DATA ANALYSIS                                                                              01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    V29        CUSTOMRY PFD WEAR                                    BY  V59        CAMPING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V59
             COUNT  I
           ROW PCT  I          ROW
           COL PCT  I          TOTAL
           TOT PCT  I     2.0I
V29        ---------I---------I
               1.0  I    18   I    18
  75                I  100.0  I  10.1
                    I   10.1  I
                    I   10.1  I
                   -I---------I
               2.0  I     6   I     6
  50-75             I  100.0  I   3.4
                    I    3.4  I
                    I    3.4  I
                   -I---------I
               3.0  I    47   I    47
  10-50             I  100.0  I  26.3
                    I   26.3  I
                    I   26.3  I
                   -I---------I
               4.0  I    47   I    47
  1-10              I  100.0  I  26.3
                    I   26.3  I
                    I   26.3  I
                   -I---------I
               5.0  I    61   I    61
  NEVER             I  100.0  I  34.1
                    I   34.1  I
                    I   34.1  I
                   -I---------I
            COLUMN      179       179
             TOTAL    100.0     100.0
```

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WEARABILITY DATA ANALYSIS                                                                            01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   V29       CUSTOMRY PFD WEAR                                                    BY  V60        SAILING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V60
              COUNT  I
            ROW PCT  I                      ROW
            COL PCT  I                      TOTAL
            TOT PCT  I     1.0I      2.0I
V29         ---------I--------I--------I
                1.0  I      0 I     18  I     18
 75                  I      0 I  100.0  I   10.1
                     I      0 I   11.3  I
                     I      0 I   10.1  I
                    -I--------I--------I
                2.0  I      0 I      6  I      6
 50-75               I      0 I  100.0  I    3.4
                     I      0 I    3.8  I
                     I      0 I    3.4  I
                    -I--------I--------I
                3.0  I      8 I     39  I     47
 10-50               I   17.0 I   83.0  I   26.3
                     I   40.0 I   24.5  I
                     I    4.5 I   21.8  I
                    -I--------I--------I
                4.0  I      6 I     41  I     47
 1-10                I   12.8 I   87.2  I   26.3
                     I   30.0 I   25.8  I
                     I    3.4 I   22.9  I
                    -I--------I--------I
                5.0  I      6 I     55  I     61
 NEVER               I    9.8 I   90.2  I   34.1
                     I   30.0 I   34.6  I
                     I    3.4 I   30.7  I
                    -I--------I--------I
             COLUMN        20      159       179
              TOTAL      11.2     88.8     100.0

RAW CHI SQUARE =      4.86849 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3011
CRAMER≠S V =       .16492
CONTINGENCY COEFFICIENT =      .16272
```

```
WEARABILITY DATA ANALYSIS                                                                   01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    V29        CUSTOMRY PFD WEAR                                   BY  V61        WATER SKIING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V61
          COUNT  I
        ROW PCT  I                     ROW
        COL PCT  I                     TOTAL
        TOT PCT  I     1.01      2.01
V29     --------I---------I---------I
             1.0 I       0 I      18 I     18
  75             I       0 I   100.0 I   10.1
                 I       0 I    10.4 I
                 I       0 I    10.1 I
                -I---------I---------I
             2.0 I       0 I       6 I      6
  50-75          I       0 I   100.0 I    3.4
                 I       0 I     3.5 I
                 I       0 I     3.4 I
                -I---------I---------I
             3.0 I       3 I      44 I     47
  10-50          I     6.4 I    93.6 I   26.3
                 I    50.0 I    25.4 I
                 I     1.7 I    24.6 I
                -I---------I---------I
             4.0 I       0 I      47 I     47
  1-10           I       0 I   100.0 I   26.3
                 I       0 I    27.2 I
                 I       0 I    26.3 I
                -I---------I---------I
             5.0 I       3 I      58 I     61
  NEVER          I     4.9 I    95.1 I   34.1
                 I    50.0 I    33.5 I
                 I     1.7 I    32.4 I
                -I---------I---------I
          COLUMN         6       173      179
           TOTAL       3.4      96.6    100.0

RAW CHI SQUARE =       4.25710 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3723
CRAMER#S V =       .15422
CONTINGENCY COEFFICIENT =       .15241
```

65

65

```
WEARABILITY DATA ANALYSIS                                                                      01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
    V29        CUSTOMARY PFD WEAR                                          BY  V62        PLEASURE CRUISING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V62
             COUNT  I
           ROW PCT  I                       ROW
           COL PCT  I                       TOTAL
           TOT PCT  I      1.01      2.01
V29        --------I---------I---------I
               1.0  I       2  I      16  I     18
  75 .              I    11.1  I    88.9  I   10.1
                    I     2.5  I    16.3  I
                    I     1.1  I     8.9  I
                   -I---------I---------I
               2.0  I       5  I       1  I      6
  50-75             I    83.3  I    16.7  I    3.4
                    I     6.2  I     1.0  I
                    I     2.8  I      .6  I
                   -I---------I---------I
               3.0  I      22  I      25  I     47
  10-50             I    46.8  I    53.2  I   26.3
                    I    27.2  I    25.5  I
                    I    12.3  I    14.0  I
                   -I---------I---------I
               4.0  I      18  I      29  I     47
  1-10              I    38.3  I    61.7  I   26.3
                    I    22.2  I    29.6  I
                    I    10.1  I    16.2  I
                   -I---------I---------I
               5.0  I      34  I      27  I     61
  NEVER             I    55.7  I    44.3  I   34.1
                    I    42.0  I    27.6  I
                    I    19.0  I    15.1  I
                   -I---------I---------I
            COLUMN         81         98        179
             TOTAL       45.3       54.7      100.0

RAW CHI SQUARE =     15.65144 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0035
CRAMER*S V =       .29570
CONTINGENCY COEFFICIENT =       .28356
```

```
                                                                                                   01/09/78
WEARABILITY DATA ANALYSIS

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
   V29        CUSTOMRY PFD WEAR                                      BY  V63        RACING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V63
          COUNT  I
          ROW PCT I          ROW
          COL PCT I          TOTAL
          TOT PCT I      2.0I
V29       --------I---------I
            1.0   I    18   I     18
  75              I 100.0   I   10.1
                  I  10.1   I
                  I  10.1   I
                 -I---------I
            2.0   I     6   I      6
  50-75           I 100.0   I    3.4
                  I   3.4   I
                  I   3.4   I
                 -I---------I
            3.0   I    47   I     47
  10-50           I 100.0   I   26.3
                  I  26.3   I
                  I  26.3   I
                 -I---------I
            4.0   I    47   I     47
  1-10            I 100.0   I   26.3
                  I  26.3   I
                  I  26.3   I
                 -I---------I
            5.0   I    61   I     61
  NEVER           I 100.0   I   34.1
                  I  34.1   I
                  I  34.1   I
                 -I---------I
         COLUMN       179        179
          TOTAL     100.0      100.0
```

```
WEARABILITY DATA ANALYSIS                                                                          01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )     COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * *
    V29       CUSTOMRY PFD WEAR                                        BY  V64       HUNTING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                       V64
              COUNT   I
              ROW PCT I           ROW
              COL PCT I           TOTAL
              TOT PCT I     2.0I
V29           --------I--------I
                  1.0 I    18  I    18
  75                  I 100.0  I  10.1
                      I  10.1  I
                      I  10.1  I
                     -I--------I
                  2.0 I     6  I     6
  50-75               I 100.0  I   3.4
                      I   3.4  I
                      I   3.4  I
                     -I--------I
                  3.0 I    47  I    47
  10-50               I 100.0  I  26.3
                      I  26.3  I
                      I  26.3  I
                     -I--------I
                  4.0 I    47  I    47
  1-10                I 100.0  I  26.3
                      I  26.3  I
                      I  26.3  I
                     -I--------I
                  5.0 I    61  I    61
  NEVER               I 100.0  I  34.1
                      I  34.1  I
                      I  34.1  I
                     -I--------I
               COLUMN     179      179
                TOTAL   100.0    100.0
```

```
WEARABILITY DATA ANALYSIS                                                                            01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    V29        CUSTOMRY PFD WEAR                                     BY  V66         WATER CONDITIONS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V66
             COUNT  I
           ROW PCT  ICALM      CHOPPY    ROUGH OR   ROW
           COL PCT  I                    WHITE      TOTAL
           TOT PCT  I     1.0I     2.0I     3.0I
V29        ---------I--------I--------I--------I
               1.0  I     6  I     8  I     4  I     18
  75                I  33.3  I  44.4  I  22.2  I   10.1
                    I  10.9  I   8.0  I  16.7  I
                    I   3.4  I   4.5  I   2.2  I
                   -I--------I--------I--------I
               2.0  I     3  I     3  I     0  I      6
 50-75              I  50.0  I  50.0  I     0  I    3.4
                    I   5.5  I   3.0  I     0  I
                    I   1.7  I   1.7  I     0  I
                   -I--------I--------I--------I
               3.0  I    12  I    32  I     3  I     47
 10-50              I  25.5  I  68.1  I   6.4  I   26.3
                    I  21.8  I  32.0  I  12.5  I
                    I   6.7  I  17.9  I   1.7  I
                   -I--------I--------I--------I
               4.0  I     4  I    35  I     8  I     47
 1-10               I   8.5  I  74.5  I  17.0  I   26.3
                    I   7.3  I  35.0  I  33.3  I
                    I   2.2  I  19.6  I   4.5  I
                   -I--------I--------I--------I
               5.0  I    30  I    22  I     9  I     61
 NEVER              I  49.2  I  36.1  I  14.8  I   34.1
                    I  54.5  I  22.0  I  37.5  I
                    I  16.8  I  12.3  I   5.0  I
                   -I--------I--------I--------I
            COLUMN       55      100       24       179
             TOTAL     30.7     55.9     13.4     100.0

RAW CHI SQUARE =     28.51111 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0004
CRAMER'S V =      .28221
CONTINGENCY COEFFICIENT =      .37067
```

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WEARABILITY DATA ANALYSIS                                                                        01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    V29        CUSTOMRY PFD WEAR                                       BY  V67         AIR TEMPERATURE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                       V67
              COUNT   I
            ROW PCT   I40 OR L  51-60     61-70     71-80     81-90       ROW
            COL PCT   I                                                  TOTAL
            TOT PCT   I     1.0I     3.0I     4.0I     5.0I     6.0I
V29         --------I--------I--------I--------I--------I--------I
                1.0  I      0  I      0  I      8  I      7  I      3  I     18
  75                 I      0  I      0  I   44.4  I   38.9  I   16.7  I   10.1
                     I      0  I      0  I   10.4  I    8.3  I   33.3  I
                     I      0  I      0  I    4.5  I    3.9  I    1.7  I
                    -I--------I--------I--------I--------I--------I
                2.0  I      0  I      0  I      3  I      3  I      0  I      6
  50-75              I      0  I      0  I   50.0  I   50.0  I      0  I    3.4
                     I      0  I      0  I    3.9  I    3.6  I      0  I
                     I      0  I      0  I    1.7  I    1.7  I      0  I
                    -I--------I--------I--------I--------I--------I
                3.0  I      0  I      1  I     16  I     27  I      3  I     47
  10-50              I      0  I    2.1  I   34.0  I   57.4  I    6.4  I   26.3
                     I      0  I   25.0  I   20.8  I   32.1  I   33.3  I
                     I      0  I     .6  I    8.9  I   15.1  I    1.7  I
                    -I--------I--------I--------I--------I--------I
                4.0  I      3  I      1  I     29  I     14  I      0  I     47
  1-10               I    6.4  I    2.1  I   61.7  I   29.8  I      0  I   26.3
                     I   60.0  I   25.0  I   37.7  I   16.7  I      0  I
                     I    1.7  I     .6  I   16.2  I    7.8  I      0  I
                    -I--------I--------I--------I--------I--------I
                5.0  I      2  I      2  I     21  I     33  I      3  I     61
  NEVER              I    3.3  I    3.3  I   34.4  I   54.1  I    4.9  I   34.1
                     I   40.0  I   50.0  I   27.3  I   39.3  I   33.3  I
                     I    1.1  I    1.1  I   11.7  I   18.4  I    1.7  I
                    -I--------I--------I--------I--------I--------I
             COLUMN         5         4        77        84         9      179
              TOTAL       2.8       2.2      43.0      46.9       5.0    100.0

RAW CHI SQUARE =     23.52567 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1004
CRAMER#S V =      .18127
CONTINGENCY COEFFICIENT =      .34082
```

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WEARABILITY DATA ANALYSIS                                                               01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    V29        CUSTOMARY PFD WEAR                                  BY  V68        WEATHER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V68
            COUNT  I
          ROW PCT  ISUNNY     CLOUDY      ROW
          COL PCT  I                      TOTAL
          TOT PCT  I      1.0I      2.0I
V29        --------I--------I--------I
              1.0  I    13  I     5  I     18
  75               I  72.2  I  27.8  I   10.2
                   I   9.5  I  12.5  I
                   I   7.3  I   2.8  I
                  -I--------I--------I
              2.0  I     3  I     3  I      6
 50-75             I  50.0  I  50.0  I    3.4
                   I   2.2  I   7.5  I
                   I   1.7  I   1.7  I
                  -I--------I--------I
              3.0  I    38  I     9  I     47
 10-50             I  80.9  I  19.1  I   26.6
                   I  27.7  I  22.5  I
                   I  21.5  I   5.1  I
                  -I--------I--------I
              4.0  I    36  I     9  I     45
 1-10              I  80.0  I  20.0  I   25.4
                   I  26.3  I  22.5  I
                   I  20.3  I   5.1  I
                  -I--------I--------I
              5.0  I    47  I    14  I     61
 NEVER             I  77.0  I  23.0  I   34.5
                   I  34.3  I  35.0  I
                   I  26.6  I   7.9  I
                  -I--------I--------I
           COLUMN      137       40       177
            TOTAL     77.4     22.6     100.0

RAW CHI SQUARE =      3.34934 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5012
CRAMER#S V =      .13756
CONTINGENCY COEFFICIENT =     .13628

NUMBER OF MISSING OBSERVATIONS =       2
```

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WEARABILITY DATA ANALYSIS                                                                             01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   V29       CUSTOMRY PFD WEAR                                               BY  V69         WIND
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                  V69
          COUNT   I
         ROW PCT  ICALM      MODERATE STRONG       ROW
         COL PCT  I                                TOTAL
         TOT PCT  I      1.0I     2.0I     3.0I
V29      --------I--------I--------I--------I
            1.0  I     8  I     8  I     1  I     17
  75             I  47.1  I  47.1  I   5.9  I   10.9
                 I  17.4  I   7.8  I  12.5  I
                 I   5.1  I   5.1  I    .6  I
                -I--------I--------I--------I
            2.0  I     3  I     3  I     0  I      6
 50-75           I  50.0  I  50.0  I     0  I    3.8
                 I   6.5  I   2.9  I     0  I
                 I   1.9  I   1.9  I     0  I
                -I--------I--------I--------I
            3.0  I     8  I    27  I     3  I     38
 10-50           I  21.1  I  71.1  I   7.9  I   24.4
                 I  17.4  I  26.5  I  37.5  I
                 I   5.1  I  17.3  I   1.9  I
                -I--------I--------I--------I
            4.0  I     8  I    34  I     3  I     45
 1-10            I  17.8  I  75.6  I   6.7  I   28.8
                 I  17.4  I  33.3  I  37.5  I
                 I   5.1  I  21.8  I   1.9  I
                -I--------I--------I--------I
            5.0  I    19  I    30  I     1  I     50
 NEVER           I  38.0  I  60.0  I   2.0  I   32.1
                 I  41.3  I  29.4  I  12.5  I
                 I  12.2  I  19.2  I    .6  I
                -I--------I--------I--------I
          COLUMN      46      102        8       156
           TOTAL    29.5     65.4      5.1     100.0

RAW CHI SQUARE =     11.14054 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =   .1939
CRAMER≠S V =      .18896
CONTINGENCY COEFFICIENT =       .25817

NUMBER OF MISSING OBSERVATIONS =       23
```

APPENDIX III-B

Wearability/Accessibility Study Crosstabulations

Crosstabulation with NV 5

~~73~~ 74x

73

74X

```
WEARABILITY DATA ANALYSIS                                                                              01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N    O F   * * * * * * * * * * * * * * * * * * * * *
     NV5                                                                BY  NV9        ATTITUDE ON ACESS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    NV9
           COUNT   I
           ROW PCT I                                 ROW
           COL PCT I                                 TOTAL
           TOT PCT I       1.I       2.I       3.I
NV5        --------I---------I---------I---------I
              1.   I     5   I    23   I    97   I   125
                   I   4.0   I  18.4   I  77.6   I  72.3
                   I  41.7   I  63.9   I  77.6   I
                   I   2.9   I  13.3   I  56.1   I
                  -I---------I---------I---------I
              2.   I     0   I     2   I     3   I     5
                   I     0   I  40.0   I  60.0   I   2.9
                   I     0   I   5.6   I   2.4   I
                   I     0   I   1.2   I   1.7   I
                  -I---------I---------I---------I
              3.   I     1   I     6   I    15   I    22
                   I   4.5   I  27.3   I  68.2   I  12.7
                   I   8.3   I  16.7   I  12.0   I
                   I    .6   I   3.5   I   8.7   I
                  -I---------I---------I---------I
              4.   I     3   I     2   I     4   I     9
                   I  33.3   I  22.2   I  44.4   I   5.2
                   I  25.0   I   5.6   I   3.2   I
                   I   1.7   I   1.2   I   2.3   I
                  -I---------I---------I---------I
              5.   I     3   I     3   I     6   I    12
                   I  25.0   I  25.0   I  50.0   I   6.9
                   I  25.0   I   8.3   I   4.8   I
                   I   1.7   I   1.7   I   3.5   I
                  -I---------I---------I---------I
           COLUMN        12        36       125      173
           TOTAL        6.9      20.8      72.3    100.0

RAW CHI SQUARE =     20.98760 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0072
CRAMER≠S V =      .24629
CONTINGENCY COEFFICIENT =      .32892

NUMBER OF MISSING OBSERVATIONS =        6
```

```
WEARABILITY DATA ANALYSIS                                                    01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
     NV5                                                        BY  NV10      ATTWEAR ROUGH CD
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                  NV10
         COUNT  I
         ROW PCT I                      ROW
         COL PCT I                      TOTAL
         TOT PCT I       2.I       3.I
NV5      --------I---------I---------I
             1.  I       5  I    120  I    125
                 I     4.0  I   96.0  I   72.3
                 I    50.0  I   73.6  I
                 I     2.9  I   69.4  I
                -I---------I---------I
             2.  I       0  I      5  I      5
                 I       0  I  100.0  I    2.9
                 I       0  I    3.1  I
                 I       0  I    2.9  I
                -I---------I---------I
             3.  I       1  I     21  I     22
                 I     4.5  I   95.5  I   12.7
                 I    10.0  I   12.9  I
                 I      .6  I   12.1  I
                -I---------I---------I
             4.  I       3  I      6  I      9
                 I    33.3  I   66.7  I    5.2
                 I    30.0  I    3.7  I
                 I     1.7  I    3.5  I
                -I---------I---------I
             5.  I       1  I     11  I     12
                 I     8.3  I   91.7  I    6.9
                 I    10.0  I    6.7  I
                 I      .6  I    6.4  I
                -I---------I---------I
         COLUMN        10       163       173
         TOTAL        5.8      94.2     100.0

RAW CHI SQUARE =     13.78484 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0080
CRAMER#S V =       .28228
CONTINGENCY COEFFICIENT =      .27166

NUMBER OF MISSING OBSERVATIONS =        6
```

```
WEARABILITY DATA ANALYSIS                                                              01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * *  C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * *
    NVS                                                        BY  NV11       ATTIT ON EFF-REL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                 NV11
         COUNT  I
       ROW PCT  I                                 ROW
       COL PCT  I                                 TOTAL
       TOT PCT  I       1.I       2.I       3.I
NVS    ---------I---------I---------I---------I
            1.  I    25   I    85   I    10   I   120
                I  20.8   I  70.8   I   8.3   I  71.9
                I  61.0   I  73.3   I 100.0   I
                I  15.0   I  50.9   I   6.0   I
               -I---------I---------I---------I
            2.  I     3   I     1   I     0   I     4
                I  75.0   I  25.0   I     0   I   2.4
                I   7.3   I    .9   I     0   I
                I   1.8   I    .6   I     0   I
               -I---------I---------I---------I
            3.  I     4   I    18   I     0   I    22
                I  18.2   I  81.8   I     0   I  13.2
                I   9.8   I  15.5   I     0   I
                I   2.4   I  10.8   I     0   I
               -I---------I---------I---------I
            4.  I     4   I     5   I     0   I     9
                I  44.4   I  55.6   I     0   I   5.4
                I   9.8   I   4.3   I     0   I
                I   2.4   I   3.0   I     0   I
               -I---------I---------I---------I
            5.  I     5   I     7   I     0   I    12
                I  41.7   I  58.3   I     0   I   7.2
                I  12.2   I   6.0   I     0   I
                I   3.0   I   4.2   I     0   I
               -I---------I---------I---------I
        COLUMN       41       116        10       167
         TOTAL     24.6      69.5       6.0     100.0

RAW CHI SQUARE =     14.10398 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0791
CRAMER#S V =      .20549
CONTINGENCY COEFFICIENT =      .27907

NUMBER OF MISSING OBSERVATIONS =       12
```

77

77

```
WEARABILITY DATA ANALYSIS                                                                 01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * * *
    NVS                                                        BY  NV12        NEED FOR PFD
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    NV12
           COUNT  I
          ROW PCT I                                   ROW
          COL PCT I                                   TOTAL
          TOT PCT I       1.I       2.I       3.I
NVS       --------I--------I---------I---------I
              1.  I      6  I     47  I     72  I    125
                  I    4.8  I   37.6  I   57.6  I   72.3
                  I   54.5  I   65.3  I   80.0  I
                  I    3.5  I   27.2  I   41.6  I
                 -I--------I---------I---------I
              2.  I      0  I      3  I      2  I      5
                  I      0  I   60.0  I   40.0  I    2.9
                  I      0  I    4.2  I    2.2  I
                  I      0  I    1.7  I    1.2  I
                 -I--------I---------I---------I
              3.  I      1  I     12  I      9  I     22
                  I    4.5  I   54.5  I   40.9  I   12.7
                  I    9.1  I   16.7  I   10.0  I
                  I     .6  I    6.9  I    5.2  I
                 -I--------I---------I---------I
              4.  I      3  I      5  I      1  I      9
                  I   33.3  I   55.6  I   11.1  I    5.2
                  I   27.3  I    6.9  I    1.1  I
                  I    1.7  I    2.9  I     .6  I
                 -I--------I---------I---------I
              5.  I      1  I      5  I      6  I     12
                  I    8.3  I   41.7  I   50.0  I    6.9
                  I    9.1  I    6.9  I    6.7  I
                  I     .6  I    2.9  I    3.5  I
                 -I--------I---------I---------I
          COLUMN        11        72        90       173
           TOTAL       6.4      41.6      52.0     100.0

RAW CHI SQUARE =     17.79024 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0229
CRAMER#S V =      .22675
CONTINGENCY COEFFICIENT =      .30536

NUMBER OF MISSING OBSERVATIONS =        6
```

```
WEARABILITY DATA ANALYSIS                                                          01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV5                                                                   BY  NV13      IMAGE
* * * * * * * * *,* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   NV13
          COUNT  I
          ROW PCT I                                   ROW
          COL PCT I                                   TOTAL
          TOT PCT I       1.I       2.I       3.I
NV5       --------I---------I---------I---------I
              1.  I     15  I     82  I     18  I    115
                  I   13.0  I   71.3  I   15.7  I   71.4
                  I   78.9  I   67.8  I   85.7  I
                  I    9.3  I   50.9  I   11.2  I
                 -I---------I---------I---------I
              2.  I      2  I      3  I      0  I      5
                  I   40.0  I   60.0  I      0  I    3.1
                  I   10.5  I    2.5  I      0  I
                  I    1.2  I    1.9  I      0  I
                 -I---------I---------I---------I
              3.  I      1  I     19  I      2  I     22
                  I    4.5  I   86.4  I    9.1  I   13.7
                  I    5.3  I   15.7  I    9.5  I
                  I     .6  I   11.8  I    1.2  I
                 -I---------I---------I---------I
              4.  I      1  I      7  I      1  I      9
                  I   11.1  I   77.8  I   11.1  I    5.6
                  I    5.3  I    5.8  I    4.8  I
                  I     .6  I    4.3  I     .6  I
                 -I---------I---------I---------I
              5.  I      0  I     10  I      0  I     10
                  I      0  I  100.0  I      0  I    6.2
                  I      0  I    8.3  I      0  I
                  I      0  I    6.2  I      0  I
                 -I---------I---------I---------I
         COLUMN         19       121        21       161
          TOTAL       11.8      75.2      13.0     100.0

RAW CHI SQUARE =     10.10739 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .2576
CRAMER#S V =      .17717
CONTINGENCY COEFFICIENT =      .24304

NUMBER OF MISSING OBSERVATIONS =        18
```

```
WEARABILITY DATA ANALYSIS                                                                            01/09/78

FILE   TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
   NVS                                                              BY  NV14      PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   NV14
          COUNT  I
        ROW PCT  I                                      ROW
        COL PCT  I                                      TOTAL
        TOT PCT  I       1.I       2.I       3.I
NVS     ---------I---------I---------I---------I
             1.  I    42   I    44   I    35   I    121
                 I  34.7   I  36.4   I  28.9   I   72.5
                 I  60.9   I  71.0   I  97.2   I
                 I  25.1   I  26.3   I  21.0   I
                -I---------I---------I---------I
             2.  I     3   I     1   I     1   I      5
                 I  60.0   I  20.0   I  20.0   I    3.0
                 I   4.3   I   1.6   I   2.8   I
                 I   1.8   I    .6   I    .6   I
                -I---------I---------I---------I
             3.  I    16   I     6   I     0   I     22
                 I  72.7   I  27.3   I     0   I   13.2
                 I  23.2   I   9.7   I     0   I
                 I   9.6   I   3.6   I     0   I
                -I---------I---------I---------I
             4.  I     4   I     5   I     0   I      9
                 I  44.4   I  55.6   I     0   I    5.4
                 I   5.8   I   8.1   I     0   I
                 I   2.4   I   3.0   I     0   I
                -I---------I---------I---------I
             5.  I     4   I     6   I     0   I     10
                 I  40.0   I  60.0   I     0   I    6.0
                 I   5.8   I   9.7   I     0   I
                 I   2.4   I   3.6   I     0   I
                -I---------I---------I---------I
          COLUMN        69        62        36      167
           TOTAL      41.3      37.1      21.6    100.0

RAW CHI SQUARE =     22.09302 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0047
CRAMER#S V =      .25719
CONTINGENCY COEFFICIENT =      .34181

NUMBER OF MISSING OBSERVATIONS =       12
```

```
WEARABILITY DATA ANALYSIS                                                              01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NVS                                                      BY  V3          AGE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                      V3
             COUNT  I
           ROW PCT  I                                                       ROW
           COL PCT  I                                                       TOTAL
           TOT PCT  I      1.0I      2.0I      3.0I      4.0I      5.0I
NVS        --------I---------I---------I---------I---------I---------I
               1.  I      20  I      39  I      31  I      19  I      15  I    124
                   I    16.1  I    31.5  I    25.0  I    15.3  I    12.1  I   74.7
                   I    71.4  I    86.7  I    81.6  I    59.4  I    65.2  I
                   I    12.0  I    23.5  I    18.7  I    11.4  I     9.0  I
                  -I---------I---------I---------I---------I---------I
               2.  I       2  I       0  I       1  I       0  I       1  I      4
                   I    50.0  I       0  I    25.0  I       0  I    25.0  I    2.4
                   I     7.1  I       0  I     2.6  I       0  I     4.3  I
                   I     1.2  I       0  I      .6  I       0  I      .6  I
                  -I---------I---------I---------I---------I---------I
               3.  I       4  I       2  I       2  I       8  I       4  I     20
                   I    20.0  I    10.0  I    10.0  I    40.0  I    20.0  I   12.0
                   I    14.3  I     4.4  I     5.3  I    25.0  I    17.4  I
                   I     2.4  I     1.2  I     1.2  I     4.8  I     2.4  I
                  -I---------I---------I---------I---------I---------I
               4.  I       2  I       0  I       3  I       3  I       1  I      9
                   I    22.2  I       0  I    33.3  I    33.3  I    11.1  I    5.4
                   I     7.1  I       0  I     7.9  I     9.4  I     4.3  I
                   I     1.2  I       0  I     1.8  I     1.8  I      .6  I
                  -I---------I---------I---------I---------I---------I
               5.  I       0  I       4  I       1  I       2  I       2  I      9
                   I       0  I    44.4  I    11.1  I    22.2  I    22.2  I    5.4
                   I       0  I     8.9  I     2.6  I     6.3  I     8.7  I
                   I       0  I     2.4  I      .6  I     1.2  I     1.2  I
                  -I---------I---------I---------I---------I---------I
            COLUMN        28        45        38        32        23         166
             TOTAL      16.9      27.1      22.9      19.3      13.9       100.0

RAW CHI SQUARE =     23.52919 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1003
CRAMER≠S V =      .18824
CONTINGENCY COEFFICIENT =        .35234

NUMBER OF MISSING OBSERVATIONS =       13
```

(81)

(81)

```
WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   NV5                                                                 BY  V4        SEX
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V4
          COUNT   I
          ROW PCT IMALE      FEMALE      ROW
          COL PCT I                      TOTAL
          TOT PCT I     1.0I      2.0I
NV5       --------I--------I--------I
             1.   I    89  I    35  I    124
                  I  71.8  I  28.2  I   72.1
                  I  76.1  I  63.6  I
                  I  51.7  I  20.3  I
                 -I--------I--------I
             2.   I     3  I     2  I      5
                  I  60.0  I  40.0  I    2.9
                  I   2.6  I   3.6  I
                  I   1.7  I   1.2  I
                 -I--------I--------I
             3.   I    12  I    10  I     22
                  I  54.5  I  45.5  I   12.8
                  I  10.3  I  18.2  I
                  I   7.0  I   5.8  I
                 -I--------I--------I
             4.   I     8  I     1  I      9
                  I  88.9  I  11.1  I    5.2
                  I   6.8  I   1.8  I
                  I   4.7  I    .6  I
                 -I--------I--------I
             5.   I     5  I     7  I     12
                  I  41.7  I  58.3  I    7.0
                  I   4.3  I  12.7  I
                  I   2.9  I   4.1  I
                 -I--------I--------I
          COLUMN      117       55       172
           TOTAL     68.0     32.0     100.0

RAW CHI SQUARE =      8.42108 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0773
CRAMER#S V =      .22127
CONTINGENCY COEFFICIENT =       .21604

NUMBER OF MISSING OBSERVATIONS =        7
```

```
WEARABILITY DATA ANALYSIS                                                                     01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV5                                                                   BY  NV6
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      NV6
             COUNT   I
             ROW PCT I                            ROW
             COL PCT I                            TOTAL
             TOT PCT I          0I          1.I
NV5          --------I----------I----------I
                 1.  I    41    I    84    I   125
                     I  32.8    I  67.2    I  72.3
                     I  74.5    I  71.2    I
                     I  23.7    I  48.6    I
                    -I----------I----------I
                 2.  I     1    I     4    I     5
                     I  20.0    I  80.0    I   2.9
                     I   1.8    I   3.4    I
                     I    .6    I   2.3    I
                    -I----------I----------I
                 3.  I     6    I    16    I    22
                     I  27.3    I  72.7    I  12.7
                     I  10.9    I  13.6    I
                     I   3.5    I   9.2    I
                    -I----------I----------I
                 4.  I     4    I     5    I     9
                     I  44.4    I  55.6    I   5.2
                     I   7.3    I   4.2    I
                     I   2.3    I   2.9    I
                    -I----------I----------I
                 5.  I     3    I     9    I    12
                     I  25.0    I  75.0    I   6.9
                     I   5.5    I   7.6    I
                     I   1.7    I   5.2    I
                    -I----------I----------I
             COLUMN       55         118       173
              TOTAL     31.8        68.2     100.0

RAW CHI SQUARE =      1.50610 WITH      4 DEGREES OF FREEDOM.   SIGNIFICANCE =    .8256
CRAMER#S V =      .09330
CONTINGENCY COEFFICIENT =       .09290

NUMBER OF MISSING OBSERVATIONS =        6
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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV5                                                           BY  V11         BOAT EXPER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V11
           COUNT  I
         ROW PCT I20-100    100-500   GREATER    ROW
         COL PCT I                     THEN 500  TOTAL
         TOT PCT I    2.0I     3.0I     4.0I
NV5     --------I--------I--------I--------I
            1.  I     6  I    20  I    99  I    125
                I   4.8  I  16.0  I  79.2  I   72.3
                I  85.7  I  83.3  I  69.7  I
                I   3.5  I  11.6  I  57.2  I
               -I--------I--------I--------I
            2.  I     1  I     0  I     4  I      5
                I  20.0  I     0  I  80.0  I    2.9
                I  14.3  I     0  I   2.8  I
                I    .6  I     0  I   2.3  I
               -I--------I--------I--------I
            3.  I     0  I     2  I    20  I     22
                I     0  I   9.1  I  90.9  I   12.7
                I     0  I   8.3  I  14.1  I
                I     0  I   1.2  I  11.6  I
               -I--------I--------I--------I
            4.  I     0  I     0  I     9  I      9
                I     0  I     0  I 100.0  I    5.2
                I     0  I     0  I   6.3  I
                I     0  I     0  I   5.2  I
               -I--------I--------I--------I
            5.  I     0  I     2  I    10  I     12
                I     0  I  16.7  I  83.3  I    6.9
                I     0  I   8.3  I   7.0  I
                I     0  I   1.2  I   5.8  I
               -I--------I--------I--------I
          COLUMN        7       24      142      173
           TOTAL      4.0     13.9     82.1    100.0

RAW CHI SQUARE =      8.53291 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3832
CRAMER#S V =      .15704
CONTINGENCY COEFFICIENT =      .21681

NUMBER OF MISSING OBSERVATIONS =        6
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WEARABILITY DATA ANALYSIS                                                                            01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV5                                                               BY  V12      LOCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE   1 OF  1

                    V12
           COUNT  I
           ROW PCT IRIVER,CR SMALL LA WATERWAY OCEAN       ROW
           COL PCT IEEK,ETC  KE       ,BAY,ETC             TOTAL
           TOT PCT I     1.0I     2.0I     4.0I     5.0I
NV5        --------I--------I--------I--------I--------I
              1.   I     1  I    18  I    21  I    82  I   122
                   I    .8  I  14.8  I  17.2  I  67.2  I  72.2
                   I 100.0  I 100.0  I  72.4  I  67.8  I
                   I    .6  I  10.7  I  12.4  I  48.5  I
                  -I--------I--------I--------I--------I
              2.   I     0  I     0  I     1  I     4  I     5
                   I     0  I     0  I  20.0  I  80.0  I   3.0
                   I     0  I     0  I   3.4  I   3.3  I
                   I     0  I     0  I    .6  I   2.4  I
                  -I--------I--------I--------I--------I
              3.   I     0  I     0  I     3  I    18  I    21
                   I     0  I     0  I  14.3  I  85.7  I  12.4
                   I     0  I     0  I  10.3  I  14.9  I
                   I     0  I     0  I   1.8  I  10.7  I
                  -I--------I--------I--------I--------I
              4.   I     0  I     0  I     3  I     6  I     9
                   I     0  I     0  I  33.3  I  66.7  I   5.3
                   I     0  I     0  I  10.3  I   5.0  I
                   I     0  I     0  I   1.8  I   3.6  I
                  -I--------I--------I--------I--------I
              5.   I     0  I     0  I     1  I    11  I    12
                   I     0  I     0  I   8.3  I  91.7  I   7.1
                   I     0  I     0  I   3.4  I   9.1  I
                   I     0  I     0  I    .6  I   6.5  I
                  -I--------I--------I--------I--------I
            COLUMN       1       18       29      121      169
             TOTAL      .6     10.7     17.2     71.6    100.0

RAW CHI SQUARE =     11.02822 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5265
CRAMER'S V =      .14749
CONTINGENCY COEFFICIENT =      .24750

NUMBER OF MISSING OBSERVATIONS =       10
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WEARABILITY DATA ANALYSIS                                                                                    01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
     NV5                                                                  BY  V13       BOAT TYPE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V13
          COUNT  I
          ROW PCT ICANOE     OTHER     SAIL      OPEN POW CABIN MO   ROW
          COL PCT I                              ER       TORBOAT   TOTAL
          TOT PCT I     1.0I     3.0I     4.0I     6.0I     7.0I
NV5       --------I--------I--------I--------I--------I--------I
             1.   I    18  I     1  I    22  I    53  I    28  I   122
                  I  14.8  I    .8  I  18.0  I  43.4  I  23.0  I  71.8
                  I 100.0  I 100.0  I  51.2  I  88.3  I  58.3  I
                  I  10.6  I    .6  I  12.9  I  31.2  I  16.5  I
                 -I--------I--------I--------I--------I--------I
             2.   I     0  I     0  I     2  I     1  I     2  I     5
                  I     0  I     0  I  40.0  I  20.0  I  40.0  I   2.9
                  I     0  I     0  I   4.7  I   1.7  I   4.2  I
                  I     0  I     0  I   1.2  I    .6  I   1.2  I
                 -I--------I--------I--------I--------I--------I
             3.   I     0  I     0  I    11  I     2  I     9  I    22
                  I     0  I     0  I  50.0  I   9.1  I  40.9  I  12.9
                  I     0  I     0  I  25.6  I   3.3  I  18.8  I
                  I     0  I     0  I   6.5  I   1.2  I   5.3  I
                 -I--------I--------I--------I--------I--------I
             4.   I     0  I     0  I     2  I     2  I     5  I     9
                  I     0  I     0  I  22.2  I  22.2  I  55.6  I   5.3
                  I     0  I     0  I   4.7  I   3.3  I  10.4  I
                  I     0  I     0  I   1.2  I   1.2  I   2.9  I
                 -I--------I--------I--------I--------I--------I
             5.   I     0  I     0  I     6  I     2  I     4  I    12
                  I     0  I     0  I  50.0  I  16.7  I  33.3  I   7.1
                  I     0  I     0  I  14.0  I   3.3  I   8.3  I
                  I     0  I     0  I   3.5  I   1.2  I   2.4  I
                 -I--------I--------I--------I--------I--------I
          COLUMN       18         1        43        60        48      170
           TOTAL     10.6        .6      25.3      35.3      28.2    100.0

RAW CHI SQUARE =     32.39900 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0089
CRAMER#S V =      .21828
CONTINGENCY COEFFICIENT =      .40009

NUMBER OF MISSING OBSERVATIONS =        9
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86

86

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[illegible] DATA ANALYSIS                                                                                01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NWS                                                          BY  V14        BOAT LENGTH
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

                  V14
        COUNT   I
        ROW PCT ILT 16     16-20     20-26     GT 26       ROW
        COL PCT I                                          TOTAL
        TOT PCT I     1.0I      2.0I      3.0I      4.0I
NWS     --------I--------I---------I---------I---------I
           1.   I    18  I     47  I      8  I     40  I    113
                I  15.9  I   41.6  I    7.1  I   35.4  I   72.0
                I 100.0  I   92.2  I   80.0  I   51.3  I
                I  11.5  I   29.9  I    5.1  I   25.5  I
               -I--------I---------I---------I---------I
           2.   I     0  I      1  I      0  I      4  I      5
                I     0  I   20.0  I      0  I   80.0  I    3.2
                I     0  I    2.0  I      0  I    5.1  I
                I     0  I     .6  I      0  I    2.5  I
               -I--------I---------I---------I---------I
           3.   I     0  I      1  I      0  I     18  I     19
                I     0  I    5.3  I      0  I   94.7  I   12.1
                I     0  I    2.0  I      0  I   23.1  I
                I     0  I     .6  I      0  I   11.5  I
               -I--------I---------I---------I---------I
           4.   I     0  I      2  I      0  I      7  I      9
                I     0  I   22.2  I      0  I   77.8  I    5.7
                I     0  I    3.9  I      0  I    9.0  I
                I     0  I    1.3  I      0  I    4.5  I
               -I--------I---------I---------I---------I
           5.   I     0  I      0  I      2  I      9  I     11
                I     0  I      0  I   18.2  I   81.8  I    7.0
                I     0  I      0  I   20.0  I   11.5  I
                I     0  I      0  I    1.3  I    5.7  I
               -I--------I---------I---------I---------I
        COLUMN       18        51        10        78       157
        TOTAL      11.5      32.5       6.4      49.7     100.0

RAW CHI SQUARE =     39.98052 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0001
CRAMER#S V =      .29135
CONTINGENCY COEFFICIENT =      .45052

NUMBER OF MISSING OBSERVATIONS =       22
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(87)

(87)

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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
     NVS                                                       BY  V29        CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V29
            COUNT  I
          ROW PCT  I75       50-75    10-50    1-10     NEVER      ROW
          COL PCT  I                                                TOTAL
          TOT PCT  I    1.0I     2.0I     3.0I     4.0I     5.0I
NVS       --------I--------I--------I--------I--------I--------I
              1.  I    18  I     6  I    41  I    24  I    36  I   125
                  I  14.4  I   4.8  I  32.8  I  19.2  I  28.8  I  72.3
                  I 100.0  I 100.0  I  91.1  I  55.8  I  59.0  I
                  I  10.4  I   3.5  I  23.7  I  13.9  I  20.8  I
                 -I--------I--------I--------I--------I--------I
              2.  I     0  I     0  I     1  I     2  I     2  I     5
                  I     0  I     0  I  20.0  I  40.0  I  40.0  I   2.9
                  I     0  I     0  I   2.2  I   4.7  I   3.3  I
                  I     0  I     0  I    .6  I   1.2  I   1.2  I
                 -I--------I--------I--------I--------I--------I
              3.  I     0  I     0  I     1  I     8  I    13  I    22
                  I     0  I     0  I   4.5  I  36.4  I  59.1  I  12.7
                  I     0  I     0  I   2.2  I  18.6  I  21.3  I
                  I     0  I     0  I    .6  I   4.6  I   7.5  I
                 -I--------I--------I--------I--------I--------I
              4.  I     0  I     0  I     0  I     2  I     7  I     9
                  I     0  I     0  I     0  I  22.2  I  77.8  I   5.2
                  I     0  I     0  I     0  I   4.7  I  11.5  I
                  I     0  I     0  I     0  I   1.2  I   4.0  I
                 -I--------I--------I--------I--------I--------I
              5.  I     0  I     0  I     2  I     7  I     3  I    12
                  I     0  I     0  I  16.7  I  58.3  I  25.0  I   6.9
                  I     0  I     0  I   4.4  I  16.3  I   4.9  I
                  I     0  I     0  I   1.2  I   4.0  I   1.7  I
                 -I--------I--------I--------I--------I--------I
           COLUMN      18        6       45       43       61      173
            TOTAL    10.4      3.5     26.0     24.9     35.3    100.0

RAW CHI SQUARE =    36.84657 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0022
CRAMER#S V =      .23075
CONTINGENCY COEFFICIENT =      .41903

NUMBER OF MISSING OBSERVATIONS =        6
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WEARABILITY DATA ANALYSIS                                                                        01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV5                                                              BY  V54        FISHING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V54
              COUNT  I
            ROW PCT  I                         ROW
            COL PCT  I                         TOTAL
            TOT PCT  I      1.01I      2.01I
NV5         ---------I---------I---------I
                  1.  I      43  I      82  I     125
                      I    34.4  I    65.6  I    72.3
                      I    89.6  I    65.6  I
                      I    24.9  I    47.4  I
                     -I---------I---------I
                  2.  I       1  I       4  I       5
                      I    20.0  I    80.0  I     2.9
                      I     2.1  I     3.2  I
                      I      .6  I     2.3  I
                     -I---------I---------I
                  3.  I       4  I      18  I      22
                      I    18.2  I    81.8  I    12.7
                      I     8.3  I    14.4  I
                      I     2.3  I    10.4  I
                     -I---------I---------I
                  4.  I       0  I       9  I       9
                      I       0  I   100.0  I     5.2
                      I       0  I     7.2  I
                      I       0  I     5.2  I
                     -I---------I---------I
                  5.  I       0  I      12  I      12
                      I       0  I   100.0  I     6.9
                      I       0  I     9.6  I
                      I       0  I     6.9  I
                     -I---------I---------I
             COLUMN          48        125       173
              TOTAL        27.7       72.3     100.0

RAW CHI SQUARE =    11.97835 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0175
CRAMER#S V =       .26313
CONTINGENCY COEFFICIENT =       .25447

NUMBER OF MISSING OBSERVATIONS =        6
```

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WEARABILITY DATA ANALYSIS                                                                01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * *
    NV5                                                          BY  V55      CANOEING OR KAYAKING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V55
           COUNT   I
           ROW PCT I                      ROW
           COL PCT I                      TOTAL
           TOT PCT I     1.0I     2.0I
NV5        --------I--------I--------I
               1.  I     15 I    110 I    125
                   I   12.0 I   88.0 I   72.3
                   I  100.0 I   69.6 I
                   I    8.7 I   63.6 I
                  -I--------I--------I
               2.  I      0 I      5 I      5
                   I      0 I  100.0 I    2.9
                   I      0 I    3.2 I
                   I      0 I    2.9 I
                  -I--------I--------I
               3.  I      0 I     22 I     22
                   I      0 I  100.0 I   12.7
                   I      0 I   13.9 I
                   I      0 I   12.7 I
                  -I--------I--------I
               4.  I      0 I      9 I      9
                   I      0 I  100.0 I    5.2
                   I      0 I    5.7 I
                   I      0 I    5.2 I
                  -I--------I--------I
               5.  I      0 I     12 I     12
                   I      0 I  100.0 I    6.9
                   I      0 I    7.6 I
                   I      0 I    6.9 I
                  -I--------I--------I
           COLUMN        15      158      173
           TOTAL        8.7     91.3    100.0

RAW CHI SQUARE =      6.30684 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1774
CRAMER≠S V =      .19093
CONTINGENCY COEFFICIENT =      .18755

NUMBER OF MISSING OBSERVATIONS =        6
```

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WEARABILITY DATA ANALYSIS                                                                                    01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV5                                                             BY  V56       SKINDIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V56
              COUNT  I
            ROW PCT  I            ROW
            COL PCT  I            TOTAL
            TOT PCT  I     2.01
NV5         ---------I---------I
                  1.  I   125   I   125
                      I 100.0   I  72.3
                      I  72.3   I
                      I  72.3   I
                     -I---------I
                  2.  I     5   I     5
                      I 100.0   I   2.9
                      I   2.9   I
                      I   2.9   I
                     -I---------I
                  3.  I    22   I    22
                      I 100.0   I  12.7
                      I  12.7   I
                      I  12.7   I
                     -I---------I
                  4.  I     9   I     9
                      I 100.0   I   5.2
                      I   5.2   I
                      I   5.2   I
                     -I---------I
                  5.  I    12   I    12
                      I 100.0   I   6.9
                      I   6.9   I
                      I   6.9   I
                     -I---------I
             COLUMN       173       173
              TOTAL     100.0     100.0

NUMBER OF MISSING OBSERVATIONS =        6
```

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WEARABILITY DATA ANALYSIS                                                                     01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV5                                                        BY  V57      SCUBA DIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V57
           COUNT  I
         ROW PCT  I                       ROW
         COL PCT  I                       TOTAL
         TOT PCT  I      1.0I      2.0I
NV5      ---------I---------I---------I
              1.  I       0 I     125 I     125
                  I       0 I   100.0 I    72.3
                  I       0 I    73.1 I
                  I       0 I    72.3 I
                 -I---------I---------I
              2.  I       0 I       5 I       5
                  I       0 I   100.0 I     2.9
                  I       0 I     2.9 I
                  I       0 I     2.9 I
                 -I---------I---------I
              3.  I       2 I      20 I      22
                  I     9.1 I    90.9 I    12.7
                  I   100.0 I    11.7 I
                  I     1.2 I    11.6 I
                 -I---------I---------I
              4.  I       0 I       9 I       9
                  I       0 I   100.0 I     5.2
                  I       0 I     5.3 I
                  I       0 I     5.2 I
                 -I---------I---------I
              5.  I       0 I      12 I      12
                  I       0 I   100.0 I     6.9
                  I       0 I     7.0 I
                  I       0 I     6.9 I
                 -I---------I---------I
          COLUMN          2       171       173
           TOTAL        1.2      98.8     100.0

RAW CHI SQUARE =     13.88783 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0077
CRAMER≠S V =      .28333
CONTINGENCY COEFFICIENT =      .27260

NUMBER OF MISSING OBSERVATIONS =        6
```

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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
     NVS                                                                   BY  V58         SWIMMING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    V58
             COUNT  I
           ROW PCT  I                        ROW
           COL PCT  I                        TOTAL
           TOT PCT  I      1.0I      2.0I
NVS        ---------I--------I--------I
                1.  I      1  I   124  I   125
                    I     .8  I  99.2  I  72.3
                    I  100.0  I  72.1  I
                    I     .6  I  71.7  I
                   -I--------I--------I
                2.  I      0  I     5  I     5
                    I      0  I 100.0  I   2.9
                    I      0  I   2.9  I
                    I      0  I   2.9  I
                   -I--------I--------I
                3.  I      0  I    22  I    22
                    I      0  I 100.0  I  12.7
                    I      0  I  12.8  I
                    I      0  I  12.7  I
                   -I--------I--------I
                4.  I      0  I     9  I     9
                    I      0  I 100.0  I   5.2
                    I      0  I   5.2  I
                    I      0  I   5.2  I
                   -I--------I--------I
                5.  I      0  I    12  I    12
                    I      0  I 100.0  I   6.9
                    I      0  I   7.0  I
                    I      0  I   6.9  I
                   -I--------I--------I
            COLUMN          1      172      173
             TOTAL         .6     99.4    100.0

RAW CHI SQUARE =       .38623 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .9836
CRAMER#S V =      .04725
CONTINGENCY COEFFICIENT =      .04720

NUMBER OF MISSING OBSERVATIONS =        6
```

```
WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
   NV5                                                                  BY  V59       CAMPING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                       V59
              COUNT  I
            ROW PCT  I              ROW
            COL PCT  I              TOTAL
            TOT PCT  I      2.0I
NV5         ---------I---------I
                  1.  I   125   I    125
                      I 100.0   I   72.3
                      I  72.3   I
                      I  72.3   I
                    -I---------I
                  2.  I     5   I      5
                      I 100.0   I    2.9
                      I   2.9   I
                      I   2.9   I
                    -I---------I
                  3.  I    22   I     22
                      I 100.0   I   12.7
                      I  12.7   I
                      I  12.7   I
                    -I---------I
                  4.  I     9   I      9
                      I 100.0   I    5.2
                      I   5.2   I
                      I   5.2   I
                    -I---------I
                  5.  I    12   I     12
                      I 100.0   I    6.9
                      I   6.9   I
                      I   6.9   I
                    -I---------I
             COLUMN       173        173
              TOTAL     100.0      100.0

NUMBER OF MISSING OBSERVATIONS =        6
```

```
WEARABILITY DATA ANALYSIS                                                               01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NVS                                                               BY  V60        SAILING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V60
              COUNT  I
            ROW PCT  I                     ROW
            COL PCT  I                     TOTAL
            TOT PCT  I      1.0I     2.0I
NVS         --------I--------I--------I
              1.    I      9  I    116  I    125
                    I    7.2  I   92.8  I   72.3
                    I   45.0  I   75.8  I
                    I    5.2  I   67.1  I
                   -I--------I--------I
              2.    I      1  I      4  I      5
                    I   20.0  I   80.0  I    2.9
                    I    5.0  I    2.6  I
                    I     .6  I    2.3  I
                   -I--------I--------I
              3.    I      4  I     18  I     22
                    I   18.2  I   81.8  I   12.7
                    I   20.0  I   11.8  I
                    I    2.3  I   10.4  I
                   -I--------I--------I
              4.    I      4  I      5  I      9
                    I   44.4  I   55.6  I    5.2
                    I   20.0  I    3.3  I
                    I    2.3  I    2.9  I
                   -I--------I--------I
              5.    I      2  I     10  I     12
                    I   16.7  I   83.3  I    6.9
                    I   10.0  I    6.5  I
                    I    1.2  I    5.8  I
                   -I--------I--------I
             COLUMN       20       153       173
              TOTAL     11.6      88.4     100.0

RAW CHI SQUARE =     13.44111 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0093
CRAMER≠S V =      .27874
CONTINGENCY COEFFICIENT =      .26850

NUMBER OF MISSING OBSERVATIONS =        6
```

```
WEARABILITY DATA ANALYSIS                                                                  01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
     NV5                                                                BY  V61        WATER SKIING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V61
           COUNT  I
         ROW PCT  I                    ROW
         COL PCT  I                    TOTAL
         TOT PCT  I     1.0I     2.0I
NV5      --------I--------I--------I
              1.  I      5  I    120  I    125
                  I    4.0  I   96.0  I   72.3
                  I   83.3  I   71.9  I
                  I    2.9  I   69.4  I
                 -I--------I--------I
              2.  I      0  I      5  I      5
                  I      0  I  100.0  I    2.9
                  I      0  I    3.0  I
                  I      0  I    2.9  I
                 -I--------I--------I
              3.  I      1  I     21  I     22
                  I    4.5  I   95.5  I   12.7
                  I   16.7  I   12.6  I
                  I     .6  I   12.1  I
                 -I--------I--------I
              4.  I      0  I      9  I      9
                  I      0  I  100.0  I    5.2
                  I      0  I    5.4  I
                  I      0  I    5.2  I
                 -I--------I--------I
              5.  I      0  I     12  I     12
                  I      0  I  100.0  I    6.9
                  I      0  I    7.2  I
                  I      0  I    6.9  I
                 -I--------I--------I
           COLUMN        6      167      173
            TOTAL      3.5     96.5    100.0

RAW CHI SQUARE =      1.11598 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .8917
CRAMER≠S V =       .08032
CONTINGENCY COEFFICIENT =       .08006

NUMBER OF MISSING OBSERVATIONS =         6
```

```
WEARABILITY DATA ANALYSIS                                                            01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV5                                                                     BY  V62       PLEASURE CRUISING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                   V62
            COUNT  I
          ROW PCT  I                         ROW
          COL PCT  I                         TOTAL
          TOT PCT  I     1.0I      2.0I
NV5       --------I--------I--------I
               1.  I     56  I     69  I     125
                   I   44.8  I   55.2  I    72.3
                   I   69.1  I   75.0  I
                   I   32.4  I   39.9  I
                  -I--------I--------I
               2.  I      4  I      1  I       5
                   I   80.0  I   20.0  I     2.9
                   I    4.9  I    1.1  I
                   I    2.3  I     .6  I
                  -I--------I--------I
               3.  I     10  I     12  I      22
                   I   45.5  I   54.5  I    12.7
                   I   12.3  I   13.0  I
                   I    5.8  I    6.9  I
                  -I--------I--------I
               4.  I      3  I      6  I       9
                   I   33.3  I   66.7  I     5.2
                   I    3.7  I    6.5  I
                   I    1.7  I    3.5  I
                  -I--------I--------I
               5.  I      8  I      4  I      12
                   I   66.7  I   33.3  I     6.9
                   I    9.9  I    4.3  I
                   I    4.6  I    2.3  I
                  -I--------I--------I
           COLUMN        81        92        173
            TOTAL      46.8      53.2      100.0

RAW CHI SQUARE =       4.98790 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .2885
CRAMER#S V =       .16980
CONTINGENCY COEFFICIENT =       .16740

NUMBER OF MISSING OBSERVATIONS =        0
```

```
WEARABILITY DATA ANALYSIS                                                                              01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV5                                                                    BY  V63        RACING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V63
            COUNT  I
          ROW PCT  I               ROW
          COL PCT  I              TOTAL
          TOT PCT  I      2.0I
NV5       --------I--------I
               1.  I    125  I    125
                   I 100.0   I   72.3
                   I  72.3   I
                   I  72.3   I
                  -I--------I
               2.  I      5  I      5
                   I 100.0   I    2.9
                   I   2.9   I
                   I   2.9   I
                  -I--------I
               3.  I [illegible] I     22
                   I 100.0   I   12.7
                   I  12.7   I
                   I  12.7   I
                  -I--------I
               4.  I      9  I      9
                   I 100.0   I    5.2
                   I   5.2   I
                   I   5.2   I
                  -I--------I
               5.  I     12  I     12
                   I 100.0   I    6.9
                   I   6.9   I
                   I   6.9   I
                  -I--------I
           COLUMN      173        173
            TOTAL    100.0      100.0

NUMBER OF MISSING OBSERVATIONS =        6
```

```
WEARABILITY DATA ANALYSIS                                                                                    01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NVS                                                                 BY  V64        HUNTING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                          V64
              COUNT  I
            ROW PCT  I            ROW
            COL PCT  I            TOTAL
            TOT PCT  I      2.0I
NVS         ---------I--------I
                 1.  I   125  I    125
                     I 100.0  I   72.3
                     I  72.3  I
                     I  72.3  I
                    -I--------I
                 2.  I     5  I      5
                     I 100.0  I    2.9
                     I   2.9  I
                     I   2.9  I
                    -I--------I
                 3.  I    22  I     22
                     I 100.0  I   12.7
                     I  12.7  I
                     I  12.7  I
                    -I--------I
                 4.  I     9  I      9
                     I 100.0  I    5.2
                     I   5.2  I
                     I   5.2  I
                    -I--------I
                 5.  I    12  I     12
                     I 100.0  I    6.9
                     I   6.9  I
                     I   6.9  I
                    -I--------I
             COLUMN      173       173
              TOTAL    100.0     100.0

NUMBER OF MISSING OBSERVATIONS =        6
```

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WEARABILITY DATA ANALYSIS                                                                       01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * *
   NVS                                                          BY  V66       WATER CONDITIONS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V66
              COUNT  I
            ROW PCT  ICALM      CHOPPY    ROUGH OR    ROW
            COL PCT  I                     WHITE     TOTAL
            TOT PCT  I     1.0I     2.0I     3.0I
NVS         ---------I--------I--------I--------I
                1.   I    37  I    70  I    18  I    125
                     I  29.6  I  56.0  I  14.4  I   72.3
                     I  67.3  I  74.5  I  75.0  I
                     I  21.4  I  40.5  I  10.4  I
                    -I--------I--------I--------I
                2.   I     3  I     2  I     0  I      5
                     I  60.0  I  40.0  I     0  I    2.9
                     I   5.5  I   2.1  I     0  I
                     I   1.7  I   1.2  I     0  I
                    -I--------I--------I--------I
                3.   I     9  I     9  I     4  I     22
                     I  40.9  I  40.9  I  18.2  I   12.7
                     I  16.4  I   9.6  I  16.7  I
                     I   5.2  I   5.2  I   2.3  I
                    -I--------I--------I--------I
                4.   I     4  I     4  I     1  I      9
                     I  44.4  I  44.4  I  11.1  I    5.2
                     I   7.3  I   4.3  I   4.2  I
                     I   2.3  I   2.3  I    .6  I
                    -I--------I--------I--------I
                5.   I     2  I     9  I     1  I     12
                     I  16.7  I  75.0  I   8.3  I    6.9
                     I   3.6  I   9.6  I   4.2  I
                     I   1.2  I   5.2  I    .6  I
                    -I--------I--------I--------I
             COLUMN        55       94       24      173
              TOTAL      31.8     54.3     13.9    100.0

RAW CHI SQUARE =      6.74815 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5640
CRAMER#S V =      .13965
CONTINGENCY COEFFICIENT =      .19376

NUMBER OF MISSING OBSERVATIONS =        6
```
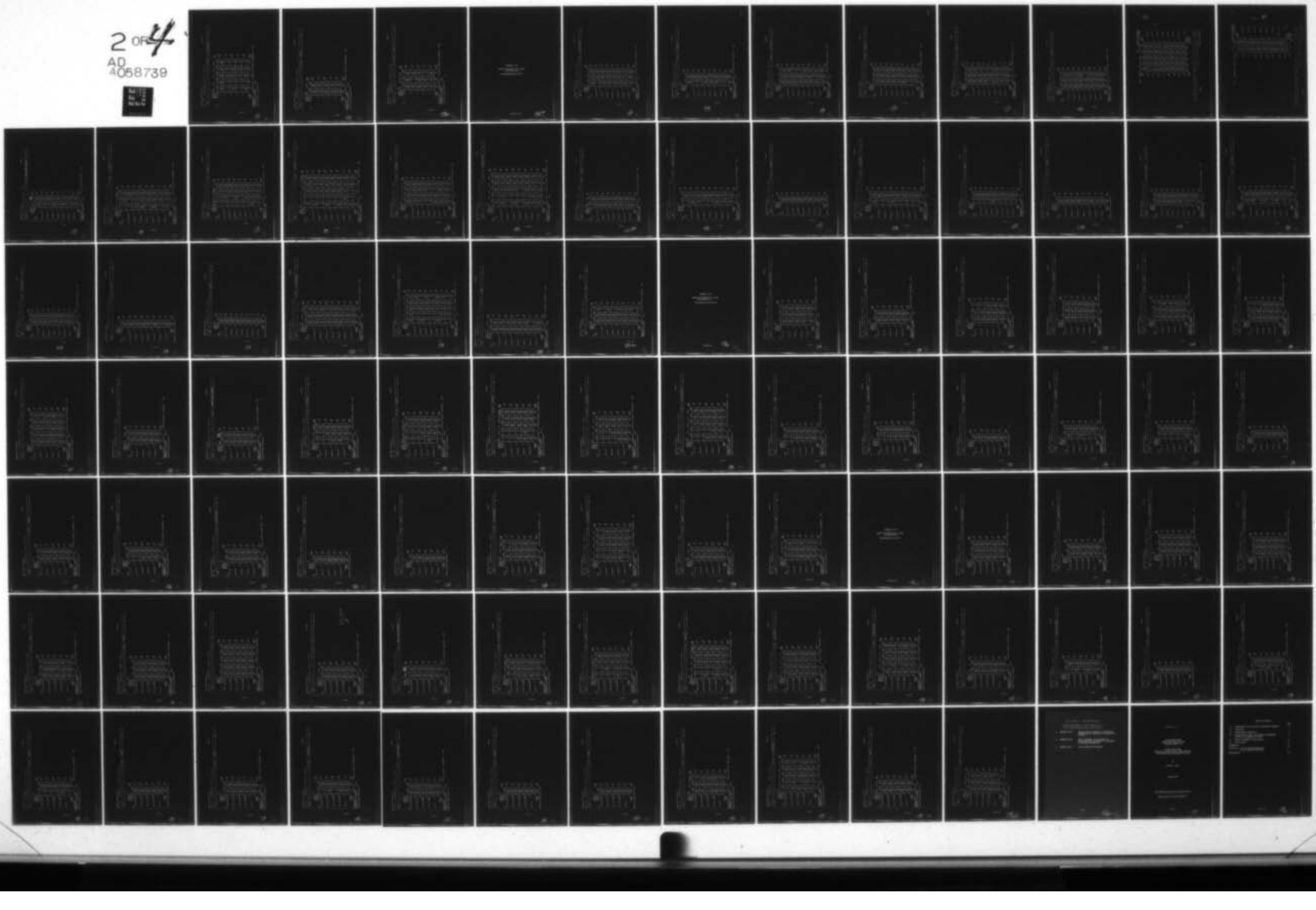

AD-A058 739   WYLE LABS HUNTSVILLE ALA   F/G 6/7
PERSONAL FLOTATION DEVICES RESEARCH. VOLUME 3. APPENDICES.(U)
JAN 78 T DOLL, M PFAUTH, J GLEASON, S COHEN   DOT-CG-42333-A
UNCLASSIFIED   MSR 78-1-VOL-3   USCG-D-41-78-VOL-3   NL

2 OF 4
AD
A058739



OF 4

8739

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WEARABILITY DATA ANALYSIS                                                                  01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
     NV5                                                        BY  V67          AIR TEMPERATURE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V67
            COUNT  I
          ROW PCT  I40 OR L  51-60     61-70     71-80     81-90       ROW
          COL PCT  I                                                   TOTAL
          TOT PCT  I      1.0I      3.0I      4.0I      5.0I      6.0I
NV5       ---------I---------I---------I---------I---------I---------I
               1.  I      3  I      4  I     50  I     59  I      9  I   125
                   I    2.4  I    3.2  I   40.0  I   47.2  I    7.2  I   72.3
                   I   60.0  I  100.0  I   66.7  I   73.7  I  100.0  I
                   I    1.7  I    2.3  I   28.9  I   34.1  I    5.2  I
                  -I---------I---------I---------I---------I---------I
               2.  I      0  I      0  I      4  I      1  I      0  I     5
                   I      0  I      0  I   80.0  I   20.0  I      0  I   2.9
                   I      0  I      0  I    5.3  I    1.2  I      0  I
                   I      0  I      0  I    2.3  I     .6  I      0  I
                  -I---------I---------I---------I---------I---------I
               3.  I      1  I      0  I     11  I     10  I      0  I    22
                   I    4.5  I      0  I   50.0  I   45.5  I      0  I  12.7
                   I   20.0  I      0  I   14.7  I   12.5  I      0  I
                   I     .6  I      0  I    6.4  I    5.8  I      0  I
                  -I---------I---------I---------I---------I---------I
               4.  I      0  I      0  I      4  I      5  I      0  I     9
                   I      0  I      0  I   44.4  I   55.6  I      0  I   5.2
                   I      0  I      0  I    5.3  I    6.3  I      0  I
                   I      0  I      0  I    2.3  I    2.9  I      0  I
                  -I---------I---------I---------I---------I---------I
               5.  I      1  I      0  I      6  I      5  I      0  I    12
                   I    8.3  I      0  I   50.0  I   41.7  I      0  I   6.9
                   I   20.0  I      0  I    8.0  I    6.3  I      0  I
                   I     .6  I      0  I    3.5  I    2.9  I      0  I
                  -I---------I---------I---------I---------I---------I
           COLUMN         5         4        75        80         9     173
            TOTAL       2.9       2.3      43.4      46.2       5.2   100.0

RAW CHI SQUARE =     10.15683 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .8583
CRAMER#S V =      .12115
CONTINGENCY COEFFICIENT =      .23549

NUMBER OF MISSING OBSERVATIONS =        6
```

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WEARABILITY DATA ANALYSIS                                                                         01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
     NV5                                                                BY  V68        WEATHER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

                         V68
                COUNT   I
                ROW PCT ISUNNY     CLOUDY      ROW
                COL PCT I                      TOTAL
                TOT PCT I     1.0I       2.0I
NV5             --------I--------I--------I
                     1. I    92  I    32  I    124
                        I  74.2  I  25.8  I   72.5
                        I  69.7  I  82.1  I
                        I  53.8  I  18.7  I
                       -I--------I--------I
                     2. I     4  I     1  I      5
                        I  80.0  I  20.0  I    2.9
                        I   3.0  I   2.6  I
                        I   2.3  I    .6  I
                       -I--------I--------I
                     3. I    19  I     3  I     22
                        I  86.4  I  13.6  I   12.9
                        I  14.4  I   7.7  I
                        I  11.1  I   1.8  I
                       -I--------I--------I
                     4. I     7  I     1  I      8
                        I  87.5  I  12.5  I    4.7
                        I   5.3  I   2.6  I
                        I   4.1  I    .6  I
                       -I--------I--------I
                     5. I    10  I     2  I     12
                        I  83.3  I  16.7  I    7.0
                        I   7.6  I   5.1  I
                        I   5.8  I   1.2  I
                       -I--------I--------I
                COLUMN      132       39        171
                 TOTAL     77.2     22.8      100.0

RAW CHI SQUARE =      2.44670 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .6542
CRAMER≠S V =      .11962
CONTINGENCY COEFFICIENT =      .11877

NUMBER OF MISSING OBSERVATIONS =         8
```

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WEARABILITY DATA ANALYSIS                                                    01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NVS                                                              BY  V69       WIND
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                      V69
            COUNT  I
          ROW PCT  ICALM      MODERATE STRONG      ROW
          COL PCT  I                              TOTAL
          TOT PCT  I      1.0I      2.0I      3.0I
NVS       ---------I---------I---------I---------I
                1. I    33   I    73   I     4   I   110
                   I  30.0   I  66.4   I   3.6   I  73.3
                   I  71.7   I  76.0   I  50.0   I
                   I  22.0   I  48.7   I   2.7   I
                  -I---------I---------I---------I
                2. I     4   I     0   I     1   I     5
                   I  80.0   I     0   I  20.0   I   3.3
                   I   8.7   I     0   I  12.5   I
                   I   2.7   I     0   I    .7   I
                  -I---------I---------I---------I
                3. I     7   I    12   I     1   I    20
                   I  35.0   I  60.0   I   5.0   I  13.3
                   I  15.2   I  12.5   I  12.5   I
                   I   4.7   I   8.0   I    .7   I
                  -I---------I---------I---------I
                4. I     1   I     4   I     0   I     5
                   I  20.0   I  80.0   I     0   I   3.3
                   I   2.2   I   4.2   I     0   I
                   I    .7   I   2.7   I     0   I
                  -I---------I---------I---------I
                5. I     1   I     7   I     2   I    10
                   I  10.0   I  70.0   I  20.0   I   6.7
                   I   2.2   I   7.3   I  25.0   I
                   I    .7   I   4.7   I   1.3   I
                  -I---------I---------I---------I
            COLUMN       46        96         8      150
             TOTAL     30.7      64.0       5.3    100.0

RAW CHI SQUARE =    16.20183 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0396
CRAMER#S V =     .23239
CONTINGENCY COEFFICIENT =      .31222

NUMBER OF MISSING OBSERVATIONS =       29
```

APPENDIX III-B

Wearability/Accessibility Study Crosstabulations

Crosstabulation with NV 15

(105) 106x

105

106x

```
WEARABILITY DATA ANALYSIS                                                              01/09/78

FILE   TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV15                                                          BY  NV9        ATTITUDE ON ACESS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   NV9
           COUNT  I
           ROW PCT I                                   ROW
           COL PCT I                                   TOTAL
           TOT PCT I       1.I       2.I       3.I
NV15       --------I---------I---------I---------I
                 0 I       4 I       7 I      31 I      42
  ZERO             I     9.5 I    16.7 I    73.8 I    23.5
                   I    33.3 I    18.9 I    23.8 I
                   I     2.2 I     3.9 I    17.3 I
                  -I---------I---------I---------I
                1. I       0 I       8 I      11 I      19
  UP TO 10 PCT     I       0 I    42.1 I    57.9 I    10.6
                   I       0 I    21.6 I     8.5 I
                   I       0 I     4.5 I     6.1 I
                  -I---------I---------I---------I
                2. I       1 I       7 I      14 I      22
  10-20 PCT        I     4.5 I    31.8 I    63.6 I    12.3
                   I     8.3 I    18.9 I    10.8 I
                   I      .6 I     3.9 I     7.8 I
                  -I---------I---------I---------I
                3. I       1 I       3 I      14 I      18
  20-30 PCT        I     5.6 I    16.7 I    77.8 I    10.1
                   I     8.3 I     8.1 I    10.8 I
                   I      .6 I     1.7 I     7.8 I
                  -I---------I---------I---------I
                4. I       1 I       3 I      10 I      14
  30-40 PCT        I     7.1 I    21.4 I    71.4 I     7.8
                   I     8.3 I     8.1 I     7.7 I
                   I      .6 I     1.7 I     5.6 I
                  -I---------I---------I---------I
                5. I       1 I       3 I      16 I      20
  40-50 PCT        I     5.0 I    15.0 I    80.0 I    11.2
                   I     8.3 I     8.1 I    12.3 I
                   I      .6 I     1.7 I     8.9 I
                  -I---------I---------I---------I
                6. I       2 I       1 I       6 I       9
  50-60 PCT        I    22.2 I    11.1 I    66.7 I     5.0
                   I    16.7 I     2.7 I     4.6 I
                   I     1.1 I      .6 I     3.4 I
                  -I---------I---------I---------I
                7. I       2 I       5 I      28 I      35
  60-70 PCT        I     5.7 I    14.3 I    80.0 I    19.6
                   I    16.7 I    13.5 I    21.5 I
                   I     1.1 I     2.8 I    15.6 I
                  -I---------I---------I---------I
            COLUMN        12        37       130       179
             TOTAL       6.7      20.7      72.6     100.0

RAW CHI SQUARE =     14.09428 WITH    14 DEGREES OF FREEDOM.  SIGNIFICANCE =    .4427
CRAMER#S V =      .19842
CONTINGENCY COEFFICIENT =      .27017
```

```
WEARABILITY DATA ANALYSIS                                                                            01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV15                                                                   BY  NV10        ATTWEAR ROUGH CD
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                        NV10
              COUNT  I
            ROW PCT  I                          ROW
            COL PCT  I                          TOTAL
            TOT PCT  I       2.I       3.I
NV15        ---------I---------I---------I
                  0  I       7  I      35  I     42
  ZERO               I    16.7  I    83.3  I   23.5
                     I    70.0  I    20.7  I
                     I     3.9  I    19.6  I
                    -I---------I---------I
                 1.  I       0  I      19  I     19
  UP TO 10 PCT       I       0  I   100.0  I   10.6
                     I       0  I    11.2  I
                     I       0  I    10.6  I
                    -I---------I---------I
                 2.  I       0  I      22  I     22
  10-20 PCT          I       0  I   100.0  I   12.3
                     I       0  I    13.0  I
                     I       0  I    12.3  I
                    -I---------I---------I
                 3.  I       1  I      17  I     18
  20-30 PCT          I     5.6  I    94.4  I   10.1
                     I    10.0  I    10.1  I
                     I      .6  I     9.5  I
                    -I---------I---------I
                 4.  I       1  I      13  I     14
  30-40 PCT          I     7.1  I    92.9  I    7.8
                     I    10.0  I     7.7  I
                     I      .6  I     7.3  I
                    -I---------I---------I
                 5.  I       1  I      19  I     20
  40-50 PCT          I     5.0  I    95.0  I   11.2
                     I    10.0  I    11.2  I
                     I      .6  I    10.6  I
                    -I---------I---------I
                 6.  I       0  I       9  I      9
  50-60 PCT          I       0  I   100.0  I    5.0
                     I       0  I     5.3  I
                     I       0  I     5.0  I
                    -I---------I---------I
                 7.  I       0  I      35  I     35
  60-70 PCT          I       0  I   100.0  I   19.6
                     I       0  I    20.7  I
                     I       0  I    19.6  I
                    -I---------I---------I
             COLUMN         10        169        179
              TOTAL        5.6       94.4      100.0

RAW CHI SQUARE =     14.88279 WITH      7 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0375
CRAMER#S V =      .28835
CONTINGENCY COEFFICIENT =      .27706
```

```
WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   NV15                                                             BY  NV11      ATTIT ON EFF-REL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    NV11
           COUNT  I
         ROW PCT  I                                 ROW
         COL PCT  I                                 TOTAL
         TOT PCT  I      1.I      2.I      3.I
NV15     --------I--------I--------I--------I
                0  I     16  I     23  I      2  I     41
  ZERO             I   39.0  I   56.1  I    4.9  I   23.7
                   I   38.1  I   19.0  I   20.0  I
                   I    9.2  I   13.3  I    1.2  I
                  -I--------I--------I--------I
               1.  I      6  I     12  I      1  I     19
  UP TO 10 PCT     I   31.6  I   63.2  I    5.3  I   11.0
                   I   14.3  I    9.9  I   10.0  I
                   I    3.5  I    6.9  I     .6  I
                  -I--------I--------I--------I
               2.  I      5  I     13  I      0  I     18
  10-20 PCT        I   27.8  I   72.2  I      0  I   10.4
                   I   11.9  I   10.7  I      0  I
                   I    2.9  I    7.5  I      0  I
                  -I--------I--------I--------I
               3.  I      2  I     16  I      0  I     18
  20-30 PCT        I   11.1  I   88.9  I      0  I   10.4
                   I    4.8  I   13.2  I      0  I
                   I    1.2  I    9.2  I      0  I
                  -I--------I--------I--------I
               4.  I      2  I     10  I      1  I     13
  30-40 PCT        I   15.4  I   76.9  I    7.7  I    7.5
                   I    4.8  I    8.3  I   10.0  I
                   I    1.2  I    5.8  I     .6  I
                  -I--------I--------I--------I
               5.  I      2  I     17  I      1  I     20
  40-50 PCT        I   10.0  I   85.0  I    5.0  I   11.6
                   I    4.8  I   14.0  I   10.0  I
                   I    1.2  I    9.8  I     .6  I
                  -I--------I--------I--------I
               6.  I      5  I      3  I      1  I      9
  50-60 PCT        I   55.6  I   33.3  I   11.1  I    5.2
                   I   11.9  I    2.5  I   10.0  I
                   I    2.9  I    1.7  I     .6  I
                  -I--------I--------I--------I
               7.  I      4  I     27  I      4  I     35
  60-70 PCT        I   11.4  I   77.1  I   11.4  I   20.2
                   I    9.5  I   22.3  I   40.0  I
                   I    2.3  I   15.6  I    2.3  I
                  -I--------I--------I--------I
          COLUMN        42       121        10       173
           TOTAL      24.3      69.9       5.8     100.0

RAW CHI SQUARE =     23.10938 WITH    14 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0585
CRAMER/S V =      .25844
CONTINGENCY COEFFICIENT =      .34328
```

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WEARABILITY DATA ANALYSIS                                                                01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV15                                                     BY  NV12        NEED FOR PFD
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

                       NV12
             COUNT   I
             ROW PCT I                                   ROW
             COL PCT I                                   TOTAL
             TOT PCT I       1.I       2.I       3.I
NV15         --------I---------I---------I---------I
                   0 I       3 I      14 I      25 I      42
  ZERO               I     7.1 I    33.3 I    59.5 I    23.5
                     I    25.0 I    18.2 I    27.8 I
                     I     1.7 I     7.8 I    14.0 I
                    -I---------I---------I---------I
                  1. I       2 I      10 I       7 I      19
  UP TO 10 PCT       I    10.5 I    52.6 I    36.8 I    10.6
                     I    16.7 I    13.0 I     7.8 I
                     I     1.1 I     5.6 I     3.9 I
                    -I---------I---------I---------I
                  2. I       2 I       9 I      11 I      22
  10-20 PCT          I     9.1 I    40.9 I    50.0 I    12.3
                     I    16.7 I    11.7 I    12.2 I
                     I     1.1 I     5.0 I     6.1 I
                    -I---------I---------I---------I
                  3. I       2 I       6 I      10 I      18
  20-30 PCT          I    11.1 I    33.3 I    55.6 I    10.1
                     I    16.7 I     7.8 I    11.1 I
                     I     1.1 I     3.4 I     5.6 I
                    -I---------I---------I---------I
                  4. I       1 I       6 I       7 I      14
  30-40 PCT          I     7.1 I    42.9 I    50.0 I     7.8
                     I     8.3 I     7.8 I     7.8 I
                     I      .6 I     3.4 I     3.9 I
                    -I---------I---------I---------I
                  5. I       2 I      10 I       8 I      20
  40-50 PCT          I    10.0 I    50.0 I    40.0 I    11.2
                     I    16.7 I    13.0 I     8.9 I
                     I     1.1 I     5.6 I     4.5 I
                    -I---------I---------I---------I
                  6. I       0 I       6 I       3 I       9
  50-60 PCT          I       0 I    66.7 I    33.3 I     5.0
                     I       0 I     7.8 I     3.3 I
                     I       0 I     3.4 I     1.7 I
                    -I---------I---------I---------I
                  7. I       0 I      16 I      19 I      35
  60-70 PCT          I       0 I    45.7 I    54.3 I    19.6
                     I       0 I    20.8 I    21.1 I
                     I       0 I     8.9 I    10.6 I
                    -I---------I---------I---------I
              COLUMN        12        77        90       179
               TOTAL       6.7      43.0      50.3     100.0

RAW CHI SQUARE =     10.15016 WITH     14 DEGREES OF FREEDOM.  SIGNIFICANCE =    .7511
CRAMER#S V =      .16838
CONTINGENCY COEFFICIENT =      .23165
```

```
WEARABILITY DATA ANALYSIS                                                                          01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )   LOLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
      NV15                                                                BY  NV13       IMAGE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     NV13
            COUNT  I
          ROW PCT  I                                ROW
          COL PCT  I                                TOTAL
          TOT PCT  I      1.I       2.I       3.I
NV15      --------I--------I--------I--------I
                0  I      5  I     28  I      7  I     40
  ZERO             I   12.5  I   70.0  I   17.5  I   24.0
                   I   26.3  I   22.0  I   33.3  I
                   I    3.0  I   16.8  I    4.2  I
                  -I--------I--------I--------I
               1.  I      2  I     13  I      4  I     19
  UP TO 10 PCT     I   10.5  I   68.4  I   21.1  I   11.4
                   I   10.5  I   10.2  I   19.0  I
                   I    1.2  I    7.8  I    2.4  I
                  -I--------I--------I--------I
               2.  I      3  I     17  I      1  I     21
  10-20 PCT        I   14.3  I   81.0  I    4.8  I   12.6
                   I   15.8  I   13.4  I    4.8  I
                   I    1.8  I   10.2  I     .6  I
                  -I--------I--------I--------I
               3.  I      3  I     13  I      0  I     16
  20-30 PCT        I   18.8  I   81.3  I      0  I    9.6
                   I   15.8  I   10.2  I      0  I
                   I    1.8  I    7.8  I      0  I
                  -I--------I--------I--------I
               4.  I      0  I     14  I      0  I     14
  30-40 PCT        I      0  I  100.0  I      0  I    8.4
                   I      0  I   11.0  I      0  I
                   I      0  I    8.4  I      0  I
                  -I--------I--------I--------I
               5.  I      4  I     11  I      4  I     19
  40-50 PCT        I   21.1  I   57.9  I   21.1  I   11.4
                   I   21.1  I    8.7  I   19.0  I
                   I    2.4  I    6.6  I    2.4  I
                  -I--------I--------I--------I
               6.  I      1  I      5  I      1  I      7
  50-60 PCT        I   14.3  I   71.4  I   14.3  I    4.2
                   I    5.3  I    3.9  I    4.8  I
                   I     .6  I    3.0  I     .6  I
                  -I--------I--------I--------I
               7.  I      1  I     26  I      4  I     31
  60-70 PCT        I    3.2  I   83.9  I   12.9  I   18.6
                   I    5.3  I   20.5  I   19.0  I
                   I     .6  I   15.6  I    2.4  I
                  -I--------I--------I--------I
           COLUMN        19       127        21      167
            TOTAL      11.4      76.0      12.6    100.0

RAW CHI SQUARE =     16.35969 WITH     14 DEGREES OF FREEDOM.  SIGNIFICANCE =    .2919
CRAMER#S V =     .22132
CONTINGENCY COEFFICIENT =      .29870
```

```
WEARABILITY DATA ANALYSIS                                                                                    01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   NV15                                                                BY  NV14        PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      NV14
              COUNT  I
              ROW PCT I                                    ROW
              COL PCT I                                    TOTAL
              TOT PCT I      1.I      2.I      3.I
NV15          --------I--------I--------I--------I
                   0  I    17  I    16  I     8  I     41
  ZERO                I  41.5  I  39.0  I  19.5  I   23.7
                      I  23.3  I  25.0  I  22.2  I
                      I   9.8  I   9.2  I   4.6  I
                     -I--------I--------I--------I
                   1. I     9  I     6  I     4  I     19
  UP TO 10 PCT        I  47.4  I  31.6  I  21.1  I   11.0
                      I  12.3  I   9.4  I  11.1  I
                      I   5.2  I   3.5  I   2.3  I
                     -I--------I--------I--------I
                   2. I    11  I     9  I     1  I     21
  10-20 PCT           I  52.4  I  42.9  I   4.8  I   12.1
                      I  15.1  I  14.1  I   2.8  I
                      I   6.4  I   5.2  I    .6  I
                     -I--------I--------I--------I
                   3. I     5  I     8  I     5  I     18
  20-30 PCT           I  27.8  I  44.4  I  27.8  I   10.4
                      I   6.8  I  12.5  I  13.9  I
                      I   2.9  I   4.6  I   2.9  I
                     -I--------I--------I--------I
                   4. I     8  I     6  I     0  I     14
  30-40 PCT           I  57.1  I  42.9  I     0  I    8.1
                      I  11.0  I   9.4  I     0  I
                      I   4.6  I   3.5  I     0  I
                     -I--------I--------I--------I
                   5. I     9  I     8  I     3  I     20
  40-50 PCT           I  45.0  I  40.0  I  15.0  I   11.6
                      I  12.3  I  12.5  I   8.3  I
                      I   5.2  I   4.6  I   1.7  I
                     -I--------I--------I--------I
                   6. I     2  I     1  I     4  I      7
  50-60 PCT           I  28.6  I  14.3  I  57.1  I    4.0
                      I   2.7  I   1.6  I  11.1  I
                      I   1.2  I    .6  I   2.3  I
                     -I--------I--------I--------I
                   7. I    12  I    10  I    11  I     33
  60-70 PCT           I  36.4  I  30.3  I  33.3  I   19.1
                      I  16.4  I  15.6  I  30.6  I
                      I   6.9  I   5.8  I   6.4  I
                     -I--------I--------I--------I
               COLUMN      73       64       36       173
               TOTAL     42.2     37.0     20.8     100.0

RAW CHI SQUARE =    18.31508 WITH    14 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1928
CRAMER'S V =      .23007
CONTINGENCY COEFFICIENT =       .30941
```

```
WEARABILITY DATA ANALYSIS                                                                          01/09/78

FILE    TED        (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NVIS                                                                BY  V3          AGE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                      V3
             COUNT  I
             ROW PCT I                                                  ROW
             COL PCT I                                                  TOTAL
             TOT PCT I     1.0I      2.0I      3.0I      4.0I      5.0I
NVIS         --------I--------I--------I--------I--------I--------I
                   0 I      5 I      8 I     13 I      5 I      7 I     38
  ZERO               I   13.2 I   21.1 I   34.2 I   13.2 I   18.4 I   22.1
                     I   17.2 I   17.4 I   33.3 I   14.3 I   30.4 I
                     I    2.9 I    4.7 I    7.6 I    2.9 I    4.1 I
                    -I--------I--------I--------I--------I--------I
                  1. I      4 I      6 I      1 I      6 I      2 I     19
  UP TO 10 PCT       I   21.1 I   31.6 I    5.3 I   31.6 I   10.5 I   11.0
                     I   13.8 I   13.0 I    2.6 I   17.1 I    8.7 I
                     I    2.3 I    3.5 I     .6 I    3.5 I    1.2 I
                    -I--------I--------I--------I--------I--------I
                  2. I      3 I      6 I      4 I      4 I      5 I     22
  10-20 PCT          I   13.6 I   27.3 I   18.2 I   18.2 I   22.7 I   12.8
                     I   10.3 I   13.0 I   10.3 I   11.4 I   21.7 I
                     I    1.7 I    3.5 I    2.3 I    2.3 I    2.9 I
                    -I--------I--------I--------I--------I--------I
                  3. I      4 I      6 I      1 I      4 I      3 I     18
  20-30 PCT          I   22.2 I   33.3 I    5.6 I   22.2 I   16.7 I   10.5
                     I   13.8 I   13.0 I    2.6 I   11.4 I   13.0 I
                     I    2.3 I    3.5 I     .6 I    2.3 I    1.7 I
                    -I--------I--------I--------I--------I--------I
                  4. I      0 I      2 I      3 I      4 I      3 I     12
  30-40 PCT          I      0 I   16.7 I   25.0 I   33.3 I   25.0 I    7.0
                     I      0 I    4.3 I    7.7 I   11.4 I   13.0 I
                     I      0 I    1.2 I    1.7 I    2.3 I    1.7 I
                    -I--------I--------I--------I--------I--------I
                  5. I      7 I      5 I      4 I      2 I      1 I     19
  40-50 PCT          I   36.8 I   26.3 I   21.1 I   10.5 I    5.3 I   11.0
                     I   24.1 I   10.9 I   10.3 I    5.7 I    4.3 I
                     I    4.1 I    2.9 I    2.3 I    1.2 I     .6 I
                    -I--------I--------I--------I--------I--------I
                  6. I      2 I      2 I      3 I      2 I      0 I      9
  50-60 PCT          I   22.2 I   22.2 I   33.3 I   22.2 I      0 I    5.2
                     I    6.9 I    4.3 I    7.7 I    5.7 I      0 I
                     I    1.2 I    1.2 I    1.7 I    1.2 I      0 I
                    -I--------I--------I--------I--------I--------I
                  7. I      4 I     11 I     10 I      8 I      2 I     35
  60-70 PCT          I   11.4 I   31.4 I   28.6 I   22.9 I    5.7 I   20.3
                     I   13.8 I   23.9 I   25.6 I   22.9 I    8.7 I
                     I    2.3 I    6.4 I    5.8 I    4.7 I    1.2 I
                    -I--------I--------I--------I--------I--------I
              COLUMN       29       46       39       35       23      172
               TOTAL     16.9     26.7     22.7     20.3     13.4    100.0

RAW CHI SQUARE =     29.85846 WITH    28 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3700
CRAMER#S V =      .20832
CONTINGENCY COEFFICIENT =      .38469
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WEARABILITY DATA ANALYSIS                                                                          11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
     NVI5                                                                     BY  V4          SEX
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                        V4
              COUNT   I
              ROW PCT IMALE      FEMALE     ROW
              COL PCT I                     TOTAL
              TOT PCT I     1.0I      2.0I
NVI5          --------I---------I---------I
                    0 I     24  I     18  I     42
  ZERO                I   57.1  I   42.9  I   25.6
                      I   21.8  I   33.3  I
                      I   14.6  I   11.0  I
                     -I---------I---------I
                   1. I     16  I      3  I     19
  UP TO 10 PCT        I   84.2  I   15.8  I   11.6
                      I   14.5  I    5.6  I
                      I    9.8  I    1.8  I
                     -I---------I---------I
                   2. I     12  I     10  I     22
  10-20 PCT           I   54.5  I   45.5  I   13.4
                      I   10.9  I   18.5  I
                      I    7.3  I    6.1  I
                     -I---------I---------I
                   3. I      9  I      9  I     18
  20-30 PCT           I   50.0  I   50.0  I   11.0
                      I    8.2  I   16.7  I
                      I    5.5  I    5.5  I
                     -I---------I---------I
                   4. I      7  I      6  I     13
  30-40 PCT           I   53.8  I   46.2  I    7.9
                      I    6.4  I   11.1  I
                      I    4.3  I    3.7  I
                     -I---------I---------I
                   5. I     16  I      4  I     20
  40-50 PCT           I   80.0  I   20.0  I   12.2
                      I   14.5  I    7.4  I
                      I    9.8  I    2.4  I
                     -I---------I---------I
                   6. I      8  I      1  I      9
  50-60 PCT           I   88.9  I   11.1  I    5.5
                      I    7.3  I    1.9  I
                      I    4.9  I     .6  I
                     -I---------I---------I
                   7. I     18  I      3  I     21
  60-70 PCT           I   85.7  I   14.3  I   12.8
                      I   16.4  I    5.6  I
                      I   11.0  I    1.8  I
                     -I---------I---------I
              COLUMN       110        54       164
              TOTAL       67.1      32.9     100.0

RAW CHI SQUARE =     16.12786 WITH     7 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0240
CRAMER#S V =      .31359
CONTINGENCY COEFFICIENT =      .29923
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(114)

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WEARABILITY DATA ANALYSIS                                                              11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV15                                                                BY  NV6  - BOATING SAFETY EDUCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   NV6
                                      ONE OR
         COUNT   I                    MORE
         ROW PCT I                    COURSES     ROW
         COL PCT I      NONE                     TOTAL
         TOT PCT I            0I          1.I
NV15     --------I---------I---------I
               0 I     11  I     31  I     42
  ZERO           I   26.2  I   73.8  I   25.5
                 I   20.4  I   27.9  I
                 I    6.7  I   18.8  I
                -I---------I---------I
              1. I      6  I     13  I     19
  UP TO 10 PCT   I   31.6  I   68.4  I   11.5
                 I   11.1  I   11.7  I
                 I    3.6  I    7.9  I
                -I---------I---------I
              2. I      2  I     20  I     22
  10-20 PCT      I    9.1  I   90.9  I   13.3
                 I    3.7  I   18.0  I
                 I    1.2  I   12.1  I
                -I---------I---------I
              3. I      7  I     11  I     18
  20-30 PCT      I   38.9  I   61.1  I   10.9
                 I   13.0  I    9.9  I
                 I    4.2  I    6.7  I
                -I---------I---------I
              4. I      3  I     11  I     14
  30-40 PCT      I   21.4  I   78.6  I    8.5
                 I    5.6  I    9.9  I
                 I    1.8  I    6.7  I
                -I---------I---------I
              5. I     11  I      9  I     20
  40-50 PCT      I   55.0  I   45.0  I   12.1
                 I   20.4  I    8.1  I
                 I    6.7  I    5.5  I
                -I---------I---------I
              6. I      2  I      7  I      9
  50-60 PCT      I   22.2  I   77.8  I    5.5
                 I    3.7  I    6.3  I
                 I    1.2  I    4.2  I
                -I---------I---------I
              7. I     12  I      9  I     21
  60-70 PCT      I   57.1  I   42.9  I   12.7
                 I   22.2  I    8.1  I
                 I    7.3  I    5.5  I
                -I---------I---------I
          COLUMN       54        111        165
           TOTAL     32.7       67.3      100.0

RAW CHI SQUARE =     18.17474 WITH      7 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0112
CRAMERAS V =       .33189
CONTINGENCY COEFFICIENT =      .31499
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WEARABILITY DATA ANALYSIS                                                          11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
   NV15                                                           BY  V11      BOAT EXPER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V11
            COUNT   I
            ROW PCT I20-100    100-500  GREATER    ROW
            COL PCT I                   THEN 500  TOTAL
            TOT PCT I      2.0I     3.0I     4.0I
NV15        --------I--------I--------I--------I
                0   I     0  I    10  I    32  I     42
  ZERO              I     0  I  23.8  I  76.2  I   25.5
                    I     0  I  45.5  I  23.5  I
                    I     0  I   6.1  I  19.4  I
                   -I--------I--------I--------I
               1.   I     0  I     0  I    19  I     19
  UP TO 10 PCT      I     0  I     0  I 100.0  I   11.5
                    I     0  I     0  I  14.0  I
                    I     0  I     0  I  11.5  I
                   -I--------I--------I--------I
               2.   I     1  I     1  I    20  I     22
  10-20 PCT         I   4.5  I   4.5  I  90.9  I   13.3
                    I  14.3  I   4.5  I  14.7  I
                    I    .6  I    .6  I  12.1  I
                   -I--------I--------I--------I
               3.   I     3  I     3  I    12  I     18
  20-30 PCT         I  16.7  I  16.7  I  66.7  I   10.9
                    I  42.9  I  13.6  I   8.8  I
                    I   1.8  I   1.8  I   7.3  I
                   -I--------I--------I--------I
               4.   I     0  I     2  I    12  I     14
  30-40 PCT         I     0  I  14.3  I  85.7  I    8.5
                    I     0  I   9.1  I   8.8  I
                    I     0  I   1.2  I   7.3  I
                   -I--------I--------I--------I
               5.   I     2  I     3  I    15  I     20
  40-50 PCT         I  10.0  I  15.0  I  75.0  I   12.1
                    I  28.6  I  13.6  I  11.0  I
                    I   1.2  I   1.8  I   9.1  I
                   -I--------I--------I--------I
               6.   I     0  I     2  I     7  I      9
  50-60 PCT         I     0  I  22.2  I  77.8  I    5.5
                    I     0  I   9.1  I   5.1  I
                    I     0  I   1.2  I   4.2  I
                   -I--------I--------I--------I
               7.   I     1  I     1  I    19  I     21
  60-70 PCT         I   4.8  I   4.8  I  90.5  I   12.7
                    I  14.3  I   4.5  I  14.0  I
                    I    .6  I    .6  I  11.5  I
                   -I--------I--------I--------I
           COLUMN         7       22      136      165
            TOTAL       4.2     13.3     82.4    100.0

RAW CHI SQUARE =     22.83564 WITH    14 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0630
CRAMER#S V =      .26306
CONTINGENCY COEFFICIENT =      .34867
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WEARABILITY DATA ANALYSIS                                                        11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * *  C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * *
   NV15                                                 BY  V12        LOCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V12
             COUNT  I
           ROW PCT  IRIVER.CR SMALL LA WATERWAY OCEAN       ROW
           COL PCT  IEEK.ETC  KE       .BAY.ETC             TOTAL
           TOT PCT  I     1.0I     2.0I     4.0I     5.0I
NV15       ---------I--------I--------I--------I--------I
                 0  I      0 I      1 I      9 I     32 I     42
  ZERO              I      0 I    2.4 I   21.4 I   76.2 I   26.1
                    I      0 I    5.6 I   32.1 I   28.1 I
                    I      0 I     .6 I    5.6 I   19.9 I
                   -I--------I--------I--------I--------I
                1.  I      0 I      4 I      1 I     14 I     19
  UP TO 10 PCT      I      0 I   21.1 I    5.3 I   73.7 I   11.8
                    I      0 I   22.2 I    3.6 I   12.3 I
                    I      0 I    2.5 I     .6 I    8.7 I
                   -I--------I--------I--------I--------I
                2.  I      0 I      0 I      4 I     16 I     20
  10-20 PCT         I      0 I      0 I   20.0 I   80.0 I   12.4
                    I      0 I      0 I   14.3 I   14.0 I
                    I      0 I      0 I    2.5 I    9.9 I
                   -I--------I--------I--------I--------I
                3.  I      0 I      2 I      2 I     14 I     18
  20-30 PCT         I      0 I   11.1 I   11.1 I   77.8 I   11.2
                    I      0 I   11.1 I    7.1 I   12.3 I
                    I      0 I    1.2 I    1.2 I    8.7 I
                   -I--------I--------I--------I--------I
                4.  I      0 I      0 I      4 I      8 I     12
  30-40 PCT         I      0 I      0 I   33.3 I   66.7 I    7.5
                    I      0 I      0 I   14.3 I    7.0 I
                    I      0 I      0 I    2.5 I    5.0 I
                   -I--------I--------I--------I--------I
                5.  I      0 I      3 I      4 I     13 I     20
  40-50 PCT         I      0 I   15.0 I   20.0 I   65.0 I   12.4
                    I      0 I   16.7 I   14.3 I   11.4 I
                    I      0 I    1.9 I    2.5 I    8.1 I
                   -I--------I--------I--------I--------I
                6.  I      1 I      1 I      1 I      6 I      9
  50-60 PCT         I   11.1 I   11.1 I   11.1 I   66.7 I    5.6
                    I  100.0 I    5.6 I    3.6 I    5.3 I
                    I     .6 I     .6 I     .6 I    3.7 I
                   -I--------I--------I--------I--------I
                7.  I      0 I      7 I      3 I     11 I     21
  60-70 PCT         I      0 I   33.3 I   14.3 I   52.4 I   13.0
                    I      0 I   38.9 I   10.7 I    9.6 I
                    I      0 I    4.3 I    1.9 I    6.8 I
                   -I--------I--------I--------I--------I
            COLUMN         1       18       28      114      161
             TOTAL        .6     11.2     17.4     70.8    100.0

RAW CHI SQUARE =    40.85979 WITH    21 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0058
CRAMER#S V =      .29085
CONTINGENCY COEFFICIENT =      .44991
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WEARABILITY DATA ANALYSIS                                                              11/04/77

FILE   TED        (CREATION DATE =  11/04/77 )    COLL PRO

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV15                                                          BY  V13       BOAT TYPE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V13
             COUNT  I
           ROW PCT  ICANOE     OTHER     SAIL      OPEN POW CABIN MO   ROW
           COL PCT  I                              ER       TORBOAT    TOTAL
           TOT PCT  I     1.0I     3.0I     4.0I     6.0I     7.0I
NV15       ---------I--------I--------I--------I--------I--------I
                  0 I      1 I      0 I     12 I     15 I     13 I     41
  ZERO              I    2.4 I      0 I   29.3 I   36.6 I   31.7 I   25.3
                    I    5.6 I      0 I   30.8 I   26.3 I   27.7 I
                    I     .6 I      0 I    7.4 I    9.3 I    8.0 I
                   -I--------I--------I--------I--------I--------I
                 1. I      4 I      0 I      6 I      3 I      6 I     19
  UP TO 10 PCT      I   21.1 I      0 I   31.6 I   15.8 I   31.6 I   11.7
                    I   22.2 I      0 I   15.4 I    5.3 I   12.8 I
                    I    2.5 I      0 I    3.7 I    1.9 I    3.7 I
                   -I--------I--------I--------I--------I--------I
                 2. I      0 I      0 I      7 I      5 I      9 I     21
  10-20 PCT         I      0 I      0 I   33.3 I   23.8 I   42.9 I   13.0
                    I      0 I      0 I   17.9 I    8.8 I   19.1 I
                    I      0 I      0 I    4.3 I    3.1 I    5.6 I
                   -I--------I--------I--------I--------I--------I
                 3. I      2 I      0 I      4 I      7 I      5 I     18
  20-30 PCT         I   11.1 I      0 I   22.2 I   38.9 I   27.8 I   11.1
                    I   11.1 I      0 I   10.3 I   12.3 I   10.6 I
                    I    1.2 I      0 I    2.5 I    4.3 I    3.1 I
                   -I--------I--------I--------I--------I--------I
                 4. I      0 I      0 I      5 I      2 I      7 I     14
  30-40 PCT         I      0 I      0 I   35.7 I   14.3 I   50.0 I    8.6
                    I      0 I      0 I   12.8 I    3.5 I   14.9 I
                    I      0 I      0 I    3.1 I    1.2 I    4.3 I
                   -I--------I--------I--------I--------I--------I
                 5. I      3 I      0 I      4 I      9 I      3 I     19
  40-50 PCT         I   15.8 I      0 I   21.1 I   47.4 I   15.8 I   11.7
                    I   16.7 I      0 I   10.3 I   15.8 I    6.4 I
                    I    1.9 I      0 I    2.5 I    5.6 I    1.9 I
                   -I--------I--------I--------I--------I--------I
                 6. I      1 I      1 I      1 I      4 I      2 I      9
  50-60 PCT         I   11.1 I   11.1 I   11.1 I   44.4 I   22.2 I    5.6
                    I    5.6 I  100.0 I    2.6 I    7.0 I    4.3 I
                    I     .6 I     .6 I     .6 I    2.5 I    1.2 I
                   -I--------I--------I--------I--------I--------I
                 7. I      7 I      0 I      0 I     12 I      2 I     21
  60-70 PCT         I   33.3 I      0 I      0 I   57.1 I    9.5 I   13.0
                    I   38.9 I      0 I      0 I   21.1 I    4.3 I
                    I    4.3 I      0 I      0 I    7.4 I    1.2 I
                   -I--------I--------I--------I--------I--------I
            COLUMN        18        1       39       57       47      162
             TOTAL      11.1       .6     24.1     35.2     29.0    100.0

RAW CHI SQUARE =     59.52152 WITH     28 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0005
CRAMER*S V =      .30307
CONTINGENCY COEFFICIENT =      .51836
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WEARABILITY DATA ANALYSIS                                                              11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N  O F  * * * * * * * * * * * * * * * * * * *
    NV15                                                             BY  V14         BOAT LENGTH
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                        V14
            COUNT  I
            ROW PCT ILT 16     16-20     20-26     GT 26      ROW
            COL PCT I                                         TOTAL
            TOT PCT I     1.0I     2.0I     3.0I     4.0I
NV15        --------I--------I--------I--------I--------I
                 0  I     6  I     8  I     1  I    23  I     38
  ZERO              I  15.8  I  21.1  I   2.6  I  60.5  I   25.3
                    I  35.3  I  16.0  I  10.0  I  31.5  I
                    I   4.0  I   5.3  I    .7  I  15.3  I
                   -I--------I--------I--------I--------I
                1.  I     1  I     6  I     2  I     9  I     18
  UP TO 10 PCT      I   5.6  I  33.3  I  11.1  I  50.0  I   12.0
                    I   5.9  I  12.0  I  20.0  I  12.3  I
                    I    .7  I   4.0  I   1.3  I   6.0  I
                   -I--------I--------I--------I--------I
                2.  I     1  I     3  I     3  I    14  I     21
  10-20 PCT         I   4.8  I  14.3  I  14.3  I  66.7  I   14.0
                    I   5.9  I   6.0  I  30.0  I  19.2  I
                    I    .7  I   2.0  I   2.0  I   9.3  I
                   -I--------I--------I--------I--------I
                3.  I     0  I     8  I     1  I     7  I     16
  20-30 PCT         I     0  I  50.0  I   6.3  I  43.8  I   10.7
                    I     0  I  16.0  I  10.0  I   9.6  I
                    I     0  I   5.3  I    .7  I   4.7  I
                   -I--------I--------I--------I--------I
                4.  I     0  I     2  I     0  I    11  I     13
  30-40 PCT         I     0  I  15.4  I     0  I  84.6  I    8.7
                    I     0  I   4.0  I     0  I  15.1  I
                    I     0  I   1.3  I     0  I   7.3  I
                   -I--------I--------I--------I--------I
                5.  I     2  I     9  I     0  I     5  I     16
  40-50 PCT         I  12.5  I  56.3  I     0  I  31.3  I   10.7
                    I  11.8  I  18.0  I     0  I   6.8  I
                    I   1.3  I   6.0  I     0  I   3.3  I
                   -I--------I--------I--------I--------I
                6.  I     2  I     1  I     2  I     3  I      8
  50-60 PCT         I  25.0  I  12.5  I  25.0  I  37.5  I    5.3
                    I  11.8  I   2.0  I  20.0  I   4.1  I
                    I   1.3  I    .7  I   1.3  I   2.0  I
                   -I--------I--------I--------I--------I
                7.  I     5  I    13  I     1  I     1  I     20
  60-70 PCT         I  25.0  I  65.0  I   5.0  I   5.0  I   13.3
                    I  29.4  I  26.0  I  10.0  I   1.4  I
                    I   3.3  I   8.7  I    .7  I    .7  I
                   -I--------I--------I--------I--------I
            COLUMN       17        50        10        73      150
             TOTAL     11.3      33.3       6.7      48.7    100.0

RAW CHI SQUARE =     50.50738 WITH    21 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0003
CRAMER#S V =       .33502
CONTINGENCY COEFFICIENT =      .50189
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WEARABILITY DATA ANALYSIS                                                                          11/04/77

FILE   TED        (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   NV15                                                                   BY  V29      CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    V29
           COUNT    I
           ROW PCT  I75        50-75     10-50     1-10      NEVER       ROW
           COL PCT  I                                                   TOTAL
           TOT PCT  I     1.0I      2.0I      3.0I      4.0I      5.0I
NV15       ---------I--------I---------I---------I---------I---------I
                 0  I     1  I     0   I    11   I    12   I    18   I    42
  ZERO              I   2.4  I     0   I  26.2   I  28.6   I  42.9   I  25.5
                    I   5.6  I     0   I  26.2   I  28.6   I  31.6   I
                    I    .6  I     0   I   6.7   I   7.3   I  10.9   I
                   -I--------I---------I---------I---------I---------I
                1.  I     3  I     1   I     4   I     3   I     8   I    19
  UP TO 10 PCT      I  15.8  I   5.3   I  21.1   I  15.8   I  42.1   I  11.5
                    I  16.7  I  16.7   I   9.5   I   7.1   I  14.0   I
                    I   1.8  I    .6   I   2.4   I   1.8   I   4.8   I
                   -I--------I---------I---------I---------I---------I
                2.  I     0  I     0   I     7   I     8   I     7   I    22
  10-20 PCT         I     0  I     0   I  31.8   I  36.4   I  31.8   I  13.3
                    I     0  I     0   I  16.7   I  19.0   I  12.3   I
                    I     0  I     0   I   4.2   I   4.8   I   4.2   I
                   -I--------I---------I---------I---------I---------I
                3.  I     5  I     0   I     3   I     5   I     5   I    18
  20-30 PCT         I  27.8  I     0   I  16.7   I  27.8   I  27.8   I  10.9
                    I  27.8  I     0   I   7.1   I  11.9   I   8.8   I
                    I   3.0  I     0   I   1.8   I   3.0   I   3.0   I
                   -I--------I---------I---------I---------I---------I
                4.  I     0  I     0   I     0   I     8   I     6   I    14
  30-40 PCT         I     0  I     0   I     0   I  57.1   I  42.9   I   8.5
                    I     0  I     0   I     0   I  19.0   I  10.5   I
                    I     0  I     0   I     0   I   4.8   I   3.6   I
                   -I--------I---------I---------I---------I---------I
                5.  I     3  I     0   I     6   I     3   I     8   I    20
  40-50 PCT         I  15.0  I     0   I  30.0   I  15.0   I  40.0   I  12.1
                    I  16.7  I     0   I  14.3   I   7.1   I  14.0   I
                    I   1.8  I     0   I   3.6   I   1.8   I   4.8   I
                   -I--------I---------I---------I---------I---------I
                6.  I     1  I     1   I     4   I     1   I     2   I     9
  50-60 PCT         I  11.1  I  11.1   I  44.4   I  11.1   I  22.2   I   5.5
                    I   5.6  I  16.7   I   9.5   I   2.4   I   3.5   I
                    I    .6  I    .6   I   2.4   I    .6   I   1.2   I
                   -I--------I---------I---------I---------I---------I
                7.  I     5  I     4   I     7   I     2   I     3   I    21
  60-70 PCT         I  23.8  I  19.0   I  33.3   I   9.5   I  14.3   I  12.7
                    I  27.8  I  66.7   I  16.7   I   4.8   I   5.3   I
                    I   3.0  I   2.4   I   4.2   I   1.2   I   1.8   I
                   -I--------I---------I---------I---------I---------I
            COLUMN       18         6        42        42        57      165
             TOTAL     10.9       3.6      25.5      25.5      34.5    100.0

RAW CHI SQUARE =     57.27650 WITH    28 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0009
CRAMER#S V =      .29459
CONTINGENCY COEFFICIENT =       .50762
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WEARABILITY DATA ANALYSIS                                                                         11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   NV15                                                                  BY  V54        FISHING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V54
           COUNT  I
          ROW PCT I   Yes       No       ROW
          COL PCT I                     TOTAL
          TOT PCT I     1.01I     2.01I
NV15      --------I--------I--------I
               0  I     4  I    38  I     42
  ZERO            I   9.5  I  90.5  I   25.5
                  I   8.5  I  32.2  I
                  I   2.4  I  23.0  I
                 -I--------I--------I
              1.  I     7  I    12  I     19
  UP TO 10 PCT    I  36.8  I  63.2  I   11.5
                  I  14.9  I  10.2  I
                  I   4.2  I   7.3  I
                 -I--------I--------I
              2.  I     6  I    16  I     22
  10-20 PCT       I  27.3  I  72.7  I   13.3
                  I  12.8  I  13.6  I
                  I   3.6  I   9.7  I
                 -I--------I--------I
              3.  I     8  I    10  I     18
  20-30 PCT       I  44.4  I  55.6  I   10.9
                  I  17.0  I   8.5  I
                  I   4.8  I   6.1  I
                 -I--------I--------I
              4.  I     3  I    11  I     14
  30-40 PCT       I  21.4  I  78.6  I    8.5
                  I   6.4  I   9.3  I
                  I   1.8  I   6.7  I
                 -I--------I--------I
              5.  I     7  I    13  I     20
  40-50 PCT       I  35.0  I  65.0  I   12.1
                  I  14.9  I  11.0  I
                  I   4.2  I   7.9  I
                 -I--------I--------I
              6.  I     1  I     8  I      9
  50-60 PCT       I  11.1  I  88.9  I    5.5
                  I   2.1  I   6.8  I
                  I    .6  I   4.8  I
                 -I--------I--------I
              7.  I    11  I    10  I     21
  60-70 PCT       I  52.4  I  47.6  I   12.7
                  I  23.4  I   8.5  I
                  I   6.7  I   6.1  I
                 -I--------I--------I
           COLUMN      47       118      165
            TOTAL    28.5      71.5    100.0

RAW CHI SQUARE =    18.30944 WITH     7 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0107
CRAMER#S V =      .33312
CONTINGENCY COEFFICIENT =     .31604
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WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    LOEL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV15                                                       BY  V55       CANOEING OR KAYAKING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V55
             COUNT  I
             ROW PCT I                         ROW
             COL PCT I                         TOTAL
             TOT PCT I      1.0I      2.0I
NV15         --------I---------I---------I
                    0 I       0 I      42 I      42
  ZERO                I       0 I   100.0 I    25.5
                      I       0 I    28.2 I
                      I       0 I    25.5 I
                     -I---------I---------I
                   1. I       5 I      14 I      19
  UP TO 10 PCT        I    26.3 I    73.7 I    11.5
                      I    31.3 I     9.4 I
                      I     3.0 I     8.5 I
                     -I---------I---------I
                   2. I       1 I      21 I      22
  10-20 PCT           I     4.5 I    95.5 I    13.3
                      I     6.3 I    14.1 I
                      I      .6 I    12.7 I
                     -I---------I---------I
                   3. I       0 I      18 I      18
  20-30 PCT           I       0 I   100.0 I    10.9
                      I       0 I    12.1 I
                      I       0 I    10.9 I
                     -I---------I---------I
                   4. I       0 I      14 I      14
  30-40 PCT           I       0 I   100.0 I     8.5
                      I       0 I     9.4 I
                      I       0 I     8.5 I
                     -I---------I---------I
                   5. I       2 I      18 I      20
  40-50 PCT           I    10.0 I    90.0 I    12.1
                      I    12.5 I    12.1 I
                      I     1.2 I    10.9 I
                     -I---------I---------I
                   6. I       1 I       8 I       9
  50-60 PCT           I    11.1 I    88.9 I     5.5
                      I     6.3 I     5.4 I
                      I      .6 I     4.8 I
                     -I---------I---------I
                   7. I       7 I      14 I      21
  60-70 PCT           I    33.3 I    66.7 I    12.7
                      I    43.8 I     9.4 I
                      I     4.2 I     8.5 I
                     -I---------I---------I
               COLUMN        16       149       165
               TOTAL        9.7      90.3     100.0

RAW CHI SQUARE =     28.02637 WITH     7 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0002
CRAMER#S V =       .41214
CONTINGENCY COEFFICIENT =      .38104
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WEARABILITY DATA ANALYSIS                                                          11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV15                                                          BY  V56         SKINDIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

                        V56
              COUNT   I
            ROW PCT   I              ROW
            COL PCT   I             TOTAL
            TOT PCT   I      2.0I
NV15        ---------I---------I
                  0   I     42  I      42
  ZERO                I  100.0  I    25.5
                      I   25.5  I
                      I   25.5  I
                     -I---------I
                  1.  I     19  I      19
  UP TO 10 PCT        I  100.0  I    11.5
                      I   11.5  I
                      I   11.5  I
                     -I---------I
                  2.  I     22  I      22
  10-20 PCT           I  100.0  I    13.3
                      I   13.3  I
                      I   13.3  I
                     -I---------I
                  3.  I     18  I      18
  20-30 PCT           I  100.0  I    10.9
                      I   10.9  I
                      I   10.9  I
                     -I---------I
                  4.  I     14  I      14
  30-40 PCT           I  100.0  I     8.5
                      I    8.5  I
                      I    8.5  I
                     -I---------I
                  5.  I     20  I      20
  40-50 PCT           I  100.0  I    12.1
                      I   12.1  I
                      I   12.1  I
                     -I---------I
                  6.  I      9  I       9
  50-60 PCT           I  100.0  I     5.5
                      I    5.5  I
                      I    5.5  I
                     -I---------I
                  7.  I     21  I      21
  60-70 PCT           I  100.0  I    12.7
                      I   12.7  I
                      I   12.7  I
                     -I---------I
             COLUMN        165        165
              TOTAL      100.0      100.0

NUMBER OF MISSING OBSERVATIONS =        14
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WEARABILITY DATA ANALYSIS                                                              11/04/77

FILE   TED        (CREATION DATE =  11/04/77 )    COLL FED

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV15                                                         BY  V57       SCUBA DIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V57
            COUNT  I
          ROW PCT  I                      ROW
          COL PCT  I                      TOTAL
          TOT PCT  I    1.0I     2.0I
NV15      ---------I--------I--------I
                0  I      1 I     41 I     42
  ZERO             I    2.4 I   97.6 I   25.5
                   I   50.0 I   25.2 I
                   I     .6 I   24.8 I
                  -I--------I--------I
               1.  I      0 I     19 I     19
  UP TO 10 PCT     I      0 I  100.0 I   11.5
                   I      0 I   11.7 I
                   I      0 I   11.5 I
                  -I--------I--------I
               2.  I      0 I     22 I     22
  10-20 PCT        I      0 I  100.0 I   13.3
                   I      0 I   13.5 I
                   I      0 I   13.3 I
                  -I--------I--------I
               3.  I      1 I     17 I     18
  20-30 PCT        I    5.6 I   94.4 I   10.9
                   I   50.0 I   10.4 I
                   I     .6 I   10.3 I
                  -I--------I--------I
               4.  I      0 I     14 I     14
  30-40 PCT        I      0 I  100.0 I    8.5
                   I      0 I    8.6 I
                   I      0 I    8.5 I
                  -I--------I--------I
               5.  I      0 I     20 I     20
  40-50 PCT        I      0 I  100.0 I   12.1
                   I      0 I   12.3 I
                   I      0 I   12.1 I
                  -I--------I--------I
               6.  I      0 I      9 I      9
  50-60 PCT        I      0 I  100.0 I    5.5
                   I      0 I    5.5 I
                   I      0 I    5.5 I
                  -I--------I--------I
               7.  I      0 I     21 I     21
  60-70 PCT        I      0 I  100.0 I   12.7
                   I      0 I   12.9 I
                   I      0 I   12.7 I
                  -I--------I--------I
           COLUMN         2      163      165
            TOTAL       1.2     98.8    100.0

RAW CHI SQUARE =      4.60342 WITH      7 DEGREES OF FREEDOM.  SIGNIFICANCE =     .7082
CRAMER#S V =       .16703
CONTINGENCY COEFFICIENT =       .16475
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WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV15                                                            BY  V58      SWIMMING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V58
        COUNT  I
       ROW PCT I                   ROW
       COL PCT I                   TOTAL
       TOT PCT I    1.0I     2.0I
NV15   --------I--------I--------I
              0 I      0 I     42 I     42
  ZERO          I      0 I  100.0 I   25.5
                I      0 I   25.6 I
                I      0 I   25.5 I
              -I--------I--------I
             1. I      0 I     19 I     19
  UP TO 10 PCT  I      0 I  100.0 I   11.5
                I      0 I   11.6 I
                I      0 I   11.5 I
              -I--------I--------I
             2. I      0 I     22 I     22
  10-20 PCT     I      0 I  100.0 I   13.3
                I      0 I   13.4 I
                I      0 I   13.3 I
              -I--------I--------I
             3. I      1 I     17 I     18
  20-30 PCT     I    5.6 I   94.4 I   10.9
                I  100.0 I   10.4 I
                I     .6 I   10.3 I
              -I--------I--------I
             4. I      0 I     14 I     14
  30-40 PCT     I      0 I  100.0 I    8.5
                I      0 I    8.5 I
                I      0 I    8.5 I
              -I--------I--------I
             5. I      0 I     20 I     20
  40-50 PCT     I      0 I  100.0 I   12.1
                I      0 I   12.2 I
                I      0 I   12.1 I
              -I--------I--------I
             6. I      0 I      9 I      9
  50-60 PCT     I      0 I  100.0 I    5.5
                I      0 I    5.5 I
                I      0 I    5.5 I
              -I--------I--------I
             7. I      0 I     21 I     21
  60-70 PCT     I      0 I  100.0 I   12.7
                I      0 I   12.8 I
                I      0 I   12.7 I
              -I--------I--------I
         COLUMN        1      164      165
          TOTAL       .6     99.4    100.0

RAW CHI SQUARE =      8.21646 WITH      7 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3139
CRAMER#S V =      .22315
CONTINGENCY COEFFICIENT =      .21779
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WEARABILITY DATA ANALYSIS                                                    11/04/77

FILE    TED        (CREATION DATE =  11/04/77 )    FULL PED

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV15                                                          BY  V59        CAMPING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V59
             COUNT  I
             ROW PCT I                ROW
             COL PCT I               TOTAL
             TOT PCT I      2.01
NV15         --------I--------I
                  0  I     42  I      42
  ZERO               I  100.0  I    25.5
                     I   25.5  I
                     I   25.5  I
                    -I--------I
                  1. I     19  I      19
  UP TO 10 PCT       I  100.0  I    11.5
                     I   11.5  I
                     I   11.5  I
                    -I--------I
                  2. I     22  I      22
  10-20 PCT          I  100.0  I    13.3
                     I   13.3  I
                     I   13.3  I
                    -I--------I
                  3. I     18  I      18
  20-30 PCT          I  100.0  I    10.9
                     I   10.9  I
                     I   10.9  I
                    -I--------I
                  4. I     14  I      14
  30-40 PCT          I  100.0  I     8.5
                     I    8.5  I
                     I    8.5  I
                    -I--------I
                  5. I     20  I      20
  40-50 PCT          I  100.0  I    12.1
                     I   12.1  I
                     I   12.1  I
                    -I--------I
                  6. I      9  I       9
  50-60 PCT          I  100.0  I     5.5
                     I    5.5  I
                     I    5.5  I
                    -I--------I
                  7. I     21  I      21
  60-70 PCT          I  100.0  I    12.7
                     I   12.7  I
                     I   12.7  I
                    -I--------I
             COLUMN       165        165
              TOTAL     100.0      100.0

NUMBER OF MISSING OBSERVATIONS =       14
```

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WEARABILITY DATA ANALYSIS                                                                          11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   NV15                                                                 BY  V60        SAILING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V60
            COUNT  I
           ROW PCT I                     ROW
           COL PCT I                     TOTAL
           TOT PCT I    1.0I     2.0I
NV15       --------I--------I--------I
                 0 I      7 I     35 I     42
  ZERO             I   16.7 I   83.3 I   25.5
                   I   38.9 I   23.8 I
                   I    4.2 I   21.2 I
                  -I--------I--------I
                1. I      1 I     18 I     19
  UP TO 10 PCT     I    5.3 I   94.7 I   11.5
                   I    5.6 I   12.2 I
                   I     .6 I   10.9 I
                  -I--------I--------I
                2. I      3 I     19 I     22
  10-20 PCT        I   13.6 I   86.4 I   13.3
                   I   16.7 I   12.9 I
                   I    1.8 I   11.5 I
                  -I--------I--------I
                3. I      3 I     15 I     18
  20-30 PCT        I   16.7 I   83.3 I   10.9
                   I   16.7 I   10.2 I
                   I    1.8 I    9.1 I
                  -I--------I--------I
                4. I      2 I     12 I     14
  30-40 PCT        I   14.3 I   85.7 I    8.5
                   I   11.1 I    8.2 I
                   I    1.2 I    7.3 I
                  -I--------I--------I
                5. I      1 I     19 I     20
  40-50 PCT        I    5.0 I   95.0 I   12.1
                   I    5.6 I   12.9 I
                   I     .6 I   11.5 I
                  -I--------I--------I
                6. I      1 I      8 I      9
  50-60 PCT        I   11.1 I   88.9 I    5.5
                   I    5.6 I    5.4 I
                   I     .6 I    4.8 I
                  -I--------I--------I
                7. I      0 I     21 I     21
  60-70 PCT        I      0 I  100.0 I   12.7
                   I      0 I   14.3 I
                   I      0 I   12.7 I
                  -I--------I--------I
            COLUMN       18      147      165
             TOTAL     10.9     89.1    100.0

RAW CHI SQUARE =      6.29260 WITH      7 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5060
CRAMER'S V =      .19529
CONTINGENCY COEFFICIENT =      .19167
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WEARABILITY DATA ANALYSIS                                                                        11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * * *
   NV15                                                                   BY  V61       WATER SKIING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                         V61
             COUNT    I
             ROW PCT  I                       ROW
             COL PCT  I                       TOTAL
             TOT PCT  I     1.0I      2.0I
NV15         ---------I--------I---------I
                    0 I      1 I      41 I      42
  ZERO                I    2.4 I    97.6 I    25.5
                      I   20.0 I    25.6 I
                      I     .6 I    24.8 I
                     -I--------I---------I
                   1. I      2 I      17 I      19
  UP TO 10 PCT        I   10.5 I    89.5 I    11.5
                      I   40.0 I    10.6 I
                      I    1.2 I    10.3 I
                     -I--------I---------I
                   2. I      0 I      22 I      22
  10-20 PCT           I      0 I   100.0 I    13.3
                      I      0 I    13.7 I
                      I      0 I    13.3 I
                     -I--------I---------I
                   3. I      1 I      17 I      18
  20-30 PCT           I    5.6 I    94.4 I    10.9
                      I   20.0 I    10.6 I
                      I     .6 I    10.3 I
                     -I--------I---------I
                   4. I      0 I      14 I      14
  30-40 PCT           I      0 I   100.0 I     8.5
                      I      0 I     8.8 I
                      I      0 I     8.5 I
                     -I--------I---------I
                   5. I      1 I      19 I      20
  40-50 PCT           I    5.0 I    95.0 I    12.1
                      I   20.0 I    11.9 I
                      I     .6 I    11.5 I
                     -I--------I---------I
                   6. I      0 I       9 I       9
  50-60 PCT           I      0 I   100.0 I     5.5
                      I      0 I     5.6 I
                      I      0 I     5.5 I
                     -I--------I---------I
                   7. I      0 I      21 I      21
  60-70 PCT           I      0 I   100.0 I    12.7
                      I      0 I    13.1 I
                      I      0 I    12.7 I
                     -I--------I---------I
               COLUMN        5       160       165
                TOTAL      3.0      97.0     100.0

RAW CHI SQUARE =      6.41068 WITH     7 DEGREES OF FREEDOM.  SIGNIFICANCE =    .4927
CRAMER#S V =      .19711
CONTINGENCY COEFFICIENT =      .19339
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WEARABILITY DATA ANALYSIS                                                                11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
    NV15                                                                BY  V62      PLEASURE CRUISING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    V62
           COUNT  I
         ROW PCT  I                          ROW
         COL PCT  I                          TOTAL
         TOT PCT  I      1.0I      2.0I
NV15     ---------I---------I---------I
                0 I      27 I      15 I      42
  ZERO            I    64.3 I    35.7 I    25.5
                  I    35.1 I    17.0 I
                  I    16.4 I     9.1 I
                 -I---------I---------I
               1. I       3 I      16 I      19
  UP TO 10 PCT    I    15.8 I    84.2 I    11.5
                  I     3.9 I    18.2 I
                  I     1.8 I     9.7 I
                 -I---------I---------I
               2. I      14 I       8 I      22
  10-20 PCT       I    63.6 I    36.4 I    13.3
                  I    18.2 I     9.1 I
                  I     8.5 I     4.8 I
                 -I---------I---------I
               3. I       7 I      11 I      18
  20-30 PCT       I    38.9 I    61.1 I    10.9
                  I     9.1 I    12.5 I
                  I     4.2 I     6.7 I
                 -I---------I---------I
               4. I       6 I       8 I      14
  30-40 PCT       I    42.9 I    57.1 I     8.5
                  I     7.8 I     9.1 I
                  I     3.6 I     4.8 I
                 -I---------I---------I
               5. I       6 I      14 I      20
  40-50 PCT       I    30.0 I    70.0 I    12.1
                  I     7.8 I    15.9 I
                  I     3.6 I     8.5 I
                 -I---------I---------I
               6. I       4 I       5 I       9
  50-60 PCT       I    44.4 I    55.6 I     5.5
                  I     5.2 I     5.7 I
                  I     2.4 I     3.0 I
                 -I---------I---------I
               7. I      10 I      11 I      21
  60-70 PCT       I    47.6 I    52.4 I    12.7
                  I    13.0 I    12.5 I
                  I     6.1 I     6.7 I
                 -I---------I---------I
           COLUMN        77        88       165
            TOTAL      46.7      53.3     100.0

RAW CHI SQUARE =    17.83896 WITH     7 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0127
CRAMER#S V =      .32481
CONTINGENCY COEFFICIENT =      .31236
```

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WEARABILITY DATA ANALYSIS                                                                     11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PED

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV15                                                                 BY  V63       RACING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V63
               COUNT  I
             ROW PCT  I             ROW
             COL PCT  I             TOTAL
             TOT PCT  I       2.0I
NV15         --------I---------I
                   0  I     42  I     42
  ZERO                I  100.0  I   25.5
                      I   25.5  I
                      I   25.5  I
                     -I---------I
                  1.  I     19  I     19
  UP TO 10 PCT        I  100.0  I   11.5
                      I   11.5  I
                      I   11.5  I
                     -I---------I
                  2.  I     22  I     22
  10-20 PCT           I  100.0  I   13.3
                      I   13.3  I
                      I   13.3  I
                     -I---------I
                  3.  I     18  I     18
  20-30 PCT           I  100.0  I   10.9
                      I   10.9  I
                      I   10.9  I
                     -I---------I
                  4.  I     14  I     14
  30-40 PCT           I  100.0  I    8.5
                      I    8.5  I
                      I    8.5  I
                     -I---------I
                  5.  I     20  I     20
  40-50 PCT           I  100.0  I   12.1
                      I   12.1  I
                      I   12.1  I
                     -I---------I
                  6.  I      9  I      9
  50-60 PCT           I  100.0  I    5.5
                      I    5.5  I
                      I    5.5  I
                     -I---------I
                  7.  I     21  I     21
  60-70 PCT           I  100.0  I   12.7
                      I   12.7  I
                      I   12.7  I
                     -I---------I
              COLUMN       165       165
               TOTAL     100.0     100.0

NUMBER OF MISSING OBSERVATIONS =        14
```

```
WEARABILITY DATA ANALYSIS                                                               11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV15                                                                BY  V64        HUNTING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                         V64
            COUNT  I
            ROW PCT I              ROW
            COL PCT I              TOTAL
            TOT PCT I      2.0I
NV15        --------I--------I
                  0 I      42 I     42
  ZERO              I   100.0 I   25.5
                    I    25.5 I
                    I    25.5 I
                   -I--------I
                 1. I      19 I     19
  UP TO 10 PCT      I   100.0 I   11.5
                    I    11.5 I
                    I    11.5 I
                   -I--------I
                 2. I      22 I     22
  10-20 PCT         I   100.0 I   13.3
                    I    13.3 I
                    I    13.3 I
                   -I--------I
                 3. I      18 I     18
  20-30 PCT         I   100.0 I   10.9
                    I    10.9 I
                    I    10.9 I
                   -I--------I
                 4. I      14 I     14
  30-40 PCT         I   100.0 I    8.5
                    I     8.5 I
                    I     8.5 I
                   -I--------I
                 5. I      20 I     20
  40-50 PCT         I   100.0 I   12.1
                    I    12.1 I
                    I    12.1 I
                   -I--------I
                 6. I       9 I      9
  50-60 PCT         I   100.0 I    5.5
                    I     5.5 I
                    I     5.5 I
                   -I--------I
                 7. I      21 I     21
  60-70 PCT         I   100.0 I   12.7
                    I    12.7 I
                    I    12.7 I
                   -I--------I
             COLUMN       165      165
              TOTAL     100.0    100.0

NUMBER OF MISSING OBSERVATIONS =        14
```

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WEARABILITY DATA ANALYSIS                                                        11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV15                                                         BY  V66        WATER CONDITIONS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                        V66
               COUNT   I
               ROW PCT ICALM      CHOPPY    ROUGH OR    ROW
               COL PCT I                     WHITE      TOTAL
               TOT PCT I     1.0I      2.0I      3.0I
NV15           --------I---------I---------I---------I
                     0 I    17   I    22   I     3   I    42
  ZERO                 I  40.5   I  52.4   I   7.1   I  25.5
                       I  31.5   I  25.0   I  13.0   I
                       I  10.3   I  13.3   I   1.8   I
                      -I---------I---------I---------I
                    1. I     8   I     9   I     2   I    19
  UP TO 10 PCT         I  42.1   I  47.4   I  10.5   I  11.5
                       I  14.8   I  10.2   I   8.7   I
                       I   4.8   I   5.5   I   1.2   I
                      -I---------I---------I---------I
                    2. I     6   I    13   I     3   I    22
  10-20 PCT            I  27.3   I  59.1   I  13.6   I  13.3
                       I  11.1   I  14.8   I  13.0   I
                       I   3.6   I   7.9   I   1.8   I
                      -I---------I---------I---------I
                    3. I     4   I    13   I     1   I    18
  20-30 PCT            I  22.2   I  72.2   I   5.6   I  10.9
                       I   7.4   I  14.8   I   4.3   I
                       I   2.4   I   7.9   I    .6   I
                      -I---------I---------I---------I
                    4. I     3   I     6   I     5   I    14
  30-40 PCT            I  21.4   I  42.9   I  35.7   I   8.5
                       I   5.6   I   6.8   I  21.7   I
                       I   1.8   I   3.6   I   3.0   I
                      -I---------I---------I---------I
                    5. I     6   I    10   I     4   I    20
  40-50 PCT            I  30.0   I  50.0   I  20.0   I  12.1
                       I  11.1   I  11.4   I  17.4   I
                       I   3.6   I   6.1   I   2.4   I
                      -I---------I---------I---------I
                    6. I     2   I     5   I     2   I     9
  50-60 PCT            I  22.2   I  55.6   I  22.2   I   5.5
                       I   3.7   I   5.7   I   8.7   I
                       I   1.2   I   3.0   I   1.2   I
                      -I---------I---------I---------I
                    7. I     8   I    10   I     3   I    21
  60-70 PCT            I  38.1   I  47.6   I  14.3   I  12.7
                       I  14.8   I  11.4   I  13.0   I
                       I   4.8   I   6.1   I   1.8   I
                      -I---------I---------I---------I
               COLUMN       54        88        23       165
                TOTAL     32.7      53.3      13.9     100.0

RAW CHI SQUARE =     13.30306 WITH    14 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5028
CRAMER'S V =      .20078
CONTINGENCY COEFFICIENT =      .27315
```

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WEARABILITY DATA ANALYSIS                                                                          11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV15                                                             BY  V67         AIR TEMPERATURE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                 V67
         COUNT  I
         ROW PCT I40 OR L  51-60     61-70     71-80     81-90        ROW
         COL PCT I                                                   TOTAL
         TOT PCT I     1.0I      3.0I      4.0I      5.0I      6.0I
NV15     --------I--------I---------I---------I---------I---------I
               0 I      2  I      2  I     18  I     18  I      2  I     42
  ZERO           I    4.8  I    4.8  I   42.9  I   42.9  I    4.8  I   25.5
                 I   50.0  I   50.0  I   25.0  I   23.7  I   22.2  I
                 I    1.2  I    1.2  I   10.9  I   10.9  I    1.2  I
                -I---------I---------I---------I---------I---------I
              1. I      0  I      0  I      7  I      9  I      3  I     19
  UP TO 10 PCT   I      0  I      0  I   36.8  I   47.4  I   15.8  I   11.5
                 I      0  I      0  I    9.7  I   11.8  I   33.3  I
                 I      0  I      0  I    4.2  I    5.5  I    1.8  I
                -I---------I---------I---------I---------I---------I
              2. I      1  I      0  I     13  I      8  I      0  I     22
  10-20 PCT      I    4.5  I      0  I   59.1  I   36.4  I      0  I   13.3
                 I   25.0  I      0  I   18.1  I   10.5  I      0  I
                 I     .6  I      0  I    7.9  I    4.8  I      0  I
                -I---------I---------I---------I---------I---------I
              3. I      0  I      0  I      8  I      9  I      1  I     18
  20-30 PCT      I      0  I      0  I   44.4  I   50.0  I    5.6  I   10.9
                 I      0  I      0  I   11.1  I   11.8  I   11.1  I
                 I      0  I      0  I    4.8  I    5.5  I     .6  I
                -I---------I---------I---------I---------I---------I
              4. I      0  I      0  I      9  I      5  I      0  I     14
  30-40 PCT      I      0  I      0  I   64.3  I   35.7  I      0  I    8.5
                 I      0  I      0  I   12.5  I    6.6  I      0  I
                 I      0  I      0  I    5.5  I    3.0  I      0  I
                -I---------I---------I---------I---------I---------I
              5. I      1  I      0  I      7  I     10  I      2  I     20
  40-50 PCT      I    5.0  I      0  I   35.0  I   50.0  I   10.0  I   12.1
                 I   25.0  I      0  I    9.7  I   13.2  I   22.2  I
                 I     .6  I      0  I    4.2  I    6.1  I    1.2  I
                -I---------I---------I---------I---------I---------I
              6. I      0  I      1  I      2  I      5  I      1  I      9
  50-60 PCT      I      0  I   11.1  I   22.2  I   55.6  I   11.1  I    5.5
                 I      0  I   25.0  I    2.8  I    6.6  I   11.1  I
                 I      0  I     .6  I    1.2  I    3.0  I     .6  I
                -I---------I---------I---------I---------I---------I
              7. I      0  I      1  I      8  I     12  I      0  I     21
  60-70 PCT      I      0  I    4.8  I   38.1  I   57.1  I      0  I   12.7
                 I      0  I   25.0  I   11.1  I   15.8  I      0  I
                 I      0  I     .6  I    4.8  I    7.3  I      0  I
                -I---------I---------I---------I---------I---------I
          COLUMN        4         4        72        76         9       165
           TOTAL      2.4       2.4      43.6      46.1       5.5     100.0

RAW CHI SQUARE =    24.45111 WITH    28 DEGREES OF FREEDOM.  SIGNIFICANCE =    .6575
CRAMER#S V =      .19248
CONTINGENCY COEFFICIENT =      .35925
```

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WEARABILITY DATA ANALYSIS                                                                     11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PED

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV15                                                                BY  V68        WEATHER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                         V68
                 COUNT  I
                 ROW PCT ISUNNY      CLOUDY      ROW
                 COL PCT I                       TOTAL
                 TOT PCT I     1.0I      2.0I
NV15            --------I---------I---------I
                    0   I    35   I     6   I    41
  ZERO                  I  85.4   I  14.6   I  25.2
                        I  27.6   I  16.7   I
                        I  21.5   I   3.7   I
                       -I---------I---------I
                    1.  I    15   I     4   I    19
  UP TO 10 PCT          I  78.9   I  21.1   I  11.7
                        I  11.8   I  11.1   I
                        I   9.2   I   2.5   I
                       -I---------I---------I
                    2.  I    19   I     3   I    22
  10-20 PCT             I  86.4   I  13.6   I  13.5
                        I  15.0   I   8.3   I
                        I  11.7   I   1.8   I
                       -I---------I---------I
                    3.  I    12   I     6   I    18
  20-30 PCT             I  66.7   I  33.3   I  11.0
                        I   9.4   I  16.7   I
                        I   7.4   I   3.7   I
                       -I---------I---------I
                    4.  I    11   I     2   I    13
  30-40 PCT             I  84.6   I  15.4   I   8.0
                        I   8.7   I   5.6   I
                        I   6.7   I   1.2   I
                       -I---------I---------I
                    5.  I    13   I     7   I    20
  40-50 PCT             I  65.0   I  35.0   I  12.3
                        I  10.2   I  19.4   I
                        I   8.0   I   4.3   I
                       -I---------I---------I
                    6.  I     9   I     0   I     9
  50-60 PCT             I 100.0   I     0   I   5.5
                        I   7.1   I     0   I
                        I   5.5   I     0   I
                       -I---------I---------I
                    7.  I    13   I     8   I    21
  60-70 PCT             I  61.9   I  38.1   I  12.9
                        I  10.2   I  22.2   I
                        I   8.0   I   4.9   I
                       -I---------I---------I
                COLUMN      127        36       163
                 TOTAL     77.9      22.1     100.0

RAW CHI SQUARE =     11.52739 WITH     7 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1172
CRAMER#S V =      .26593
CONTINGENCY COEFFICIENT =      .25700
```

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WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    DOLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * *
   NV15                                                         BY  V69       WIND
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    V69
           COUNT  I
         ROW PCT  ICALM      MODERATE STRONG      ROW
         COL PCT  I                               TOTAL
         TOT PCT  I      1.0I      2.0I      3.0I
NV15     --------I--------I--------I--------I
               0  I     13 I     21 I      2 I     36
  ZERO            I   36.1 I   58.3 I    5.6 I   25.4
                  I   28.9 I   23.6 I   25.0 I
                  I    9.2 I   14.8 I    1.4 I
                 -I--------I--------I--------I
              1.  I      6 I     11 I      0 I     17
  UP TO 10 PCT    I   35.3 I   64.7 I      0 I   12.0
                  I   13.3 I   12.4 I      0 I
                  I    4.2 I    7.7 I      0 I
                 -I--------I--------I--------I
              2.  I      4 I     14 I      1 I     19
  10-20 PCT       I   21.1 I   73.7 I    5.3 I   13.4
                  I    8.9 I   15.7 I   12.5 I
                  I    2.8 I    9.9 I     .7 I
                 -I--------I--------I--------I
              3.  I      2 I     11 I      0 I     13
  20-30 PCT       I   15.4 I   84.6 I      0 I    9.2
                  I    4.4 I   12.4 I      0 I
                  I    1.4 I    7.7 I      0 I
                 -I--------I--------I--------I
              4.  I      2 I      8 I      1 I     11
  30-40 PCT       I   18.2 I   72.7 I    9.1 I    7.7
                  I    4.4 I    9.0 I   12.5 I
                  I    1.4 I    5.6 I     .7 I
                 -I--------I--------I--------I
              5.  I      7 I      9 I      1 I     17
  40-50 PCT       I   41.2 I   52.9 I    5.9 I   12.0
                  I   15.6 I   10.1 I   12.5 I
                  I    4.9 I    6.3 I     .7 I
                 -I--------I--------I--------I
              6.  I      3 I      3 I      3 I      9
  50-60 PCT       I   33.3 I   33.3 I   33.3 I    6.3
                  I    6.7 I    3.4 I   37.5 I
                  I    2.1 I    2.1 I    2.1 I
                 -I--------I--------I--------I
              7.  I      8 I     12 I      0 I     20
  60-70 PCT       I   40.0 I   60.0 I      0 I   14.1
                  I   17.8 I   13.5 I      0 I
                  I    5.6 I    8.5 I      0 I
                 -I--------I--------I--------I
          COLUMN       45       89        8      142
           TOTAL     31.7     62.7      5.6    100.0

RAW CHI SQUARE =     22.11337 WITH    14 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0763
CRAMER*S V =       .27904
CONTINGENCY COEFFICIENT =      .36708
```

APPENDIX III-B

Wearability/Accessibility Study Crosstabulations

Crosstabulation with NV 16

```
WEARABILITY DATA ANALYSIS                                                                      01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NV16                                                          BY  NV9        ATTITUDE ON ACESS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       NV9
            COUNT   I
            ROW PCT I                                ROW
            COL PCT I                                TOTAL
            TOT PCT I       1.I       2.I       3.I
NV16        --------I---------I---------I---------I
                 2. I      3  I      1  I      4  I      8
  0-20  PCT         I   37.5  I   12.5  I   50.0  I    4.5
                    I   25.0  I    2.7  I    3.1  I
                    I    1.7  I     .6  I    2.2  I
                   -I---------I---------I---------I
                 4. I      4  I      8  I      4  I     16
  20-40 PCT         I   25.0  I   50.0  I   25.0  I    8.9
                    I   33.3  I   21.6  I    3.1  I
                    I    2.2  I    4.5  I    2.2  I
                   -I---------I---------I---------I
                 6. I      3  I      8  I     23  I     34
  40-60 PCT         I    8.8  I   23.5  I   67.6  I   19.0
                    I   25.0  I   21.6  I   17.7  I
                    I    1.7  I    4.5  I   12.8  I
                   -I---------I---------I---------I
                 8. I      2  I     17  I     46  I     65
  60-80 PCT         I    3.1  I   26.2  I   70.8  I   36.3
                    I   16.7  I   45.9  I   35.4  I
                    I    1.1  I    9.5  I   25.7  I
                   -I---------I---------I---------I
                10. I      0  I      3  I     53  I     56
  80-100 PCT        I      0  I    5.4  I   94.6  I   31.3
                    I      0  I    8.1  I   40.8  I
                    I      0  I    1.7  I   29.6  I
                   -I---------I---------I---------I
            COLUMN        12        37       130       179
             TOTAL       6.7      20.7      72.6     100.0

RAW CHI SQUARE =     48.35993 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0000
CRAMER'S V =      .36754
CONTINGENCY COEFFICIENT =      .46120
```

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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   NV16                                                                  BY  NV10      AITWEAR ROUGH CD
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

                       NV10
               COUNT  I
              ROW PCT I                   ROW
              COL PCT I                   TOTAL
              TOT PCT I       2.I     3.I
NV16          --------I-------I-------I
                   2. I     2 I     6 I      8
  0-20  PCT           I  25.0 I  75.0 I    4.5
                      I  20.0 I   3.6 I
                      I   1.1 I   3.4 I
                     -I-------I-------I
                   4. I     2 I    14 I     16
  20-40 PCT           I  12.5 I  87.5 I    8.9
                      I  20.0 I   8.3 I
                      I   1.1 I   7.8 I
                     -I-------I-------I
                   6. I     2 I    32 I     34
  40-60 PCT           I   5.9 I  94.1 I   19.0
                      I  20.0 I  18.9 I
                      I   1.1 I  17.9 I
                     -I-------I-------I
                   8. I     3 I    62 I     65
  60-80 PCT           I   4.6 I  95.4 I   36.3
                      I  30.0 I  36.7 I
                      I   1.7 I  34.6 I
                     -I-------I-------I
                  10. I     1 I    55 I     56
  80-100 PCT          I   1.8 I  98.2 I   31.3
                      I  10.0 I  32.5 I
                      I    .6 I  30.7 I
                     -I-------I-------I
               COLUMN      10      169      179
                TOTAL     5.6     94.4    100.0

RAW CHI SQUARE =      8.82183 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0657
CRAMER#S V =       .22200
CONTINGENCY COEFFICIENT =       .21672
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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV16                                                                   BY  NV11      ATTIT ON EFF-REL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                         NV11
               COUNT  I
               ROW PCT I                                  ROW
               COL PCT I                                  TOTAL
               TOT PCT I      1.I      2.I      3.I
NV16           --------I--------I--------I--------I
                  2.   I     4  I     4  I     0  I      8
  0-20   PCT           I  50.0  I  50.0  I     0  I    4.6
                       I   9.5  I   3.3  I     0  I
                       I   2.3  I   2.3  I     0  I
                      -I--------I--------I--------I
                  4.   I     9  I     7  I     0  I     16
  20-40 PCT            I  56.3  I  43.8  I     0  I    9.2
                       I  21.4  I   5.8  I     0  I
                       I   5.2  I   4.0  I     0  I
                      -I--------I--------I--------I
                  6.   I    10  I    23  I     1  I     34
  40-60 PCT            I  29.4  I  67.6  I   2.9  I   19.7
                       I  23.8  I  19.0  I  10.0  I
                       I   5.8  I  13.3  I    .6  I
                      -I--------I--------I--------I
                  8.   I    15  I    44  I     5  I     64
  60-80 PCT            I  23.4  I  68.8  I   7.8  I   37.0
                       I  35.7  I  36.4  I  50.0  I
                       I   8.7  I  25.4  I   2.9  I
                      -I--------I--------I--------I
                 10.   I     4  I    43  I     4  I     51
  80-100 PCT           I   7.8  I  84.3  I   7.8  I   29.5
                       I   9.5  I  35.5  I  40.0  I
                       I   2.3  I  24.9  I   2.3  I
                      -I--------I--------I--------I
               COLUMN       42      121       10       173
                TOTAL     24.3     69.9      5.8     100.0

RAW CHI SQUARE =     21.24188 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0065
CRAMER*S V =     .24778
CONTINGENCY COEFFICIENT =       .33069

NUMBER OF MISSING OBSERVATIONS =         6
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WEARABILITY DATA ANALYSIS                                                                            01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * * *
   NV16                                                                  BY  NV12      NEED FOR PFD
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     NV12
             COUNT  I
           ROW PCT  I                                 ROW
           COL PCT  I                                 TOTAL
           TOT PCT  I       1.I       2.I       3.I
NV16       --------I--------I---------I---------I
                 2.  I      2  I      4  I      2  I      8
  0-20  PCT          I   25.0  I   50.0  I   25.0  I    4.5
                     I   16.7  I    5.2  I    2.2  I
                     I    1.1  I    2.2  I    1.1  I
                    -I--------I---------I---------I
                 4.  I      3  I      8  I      5  I     16
  20-40 PCT          I   18.8  I   50.0  I   31.3  I    8.9
                     I   25.0  I   10.4  I    5.6  I
                     I    1.7  I    4.5  I    2.8  I
                    -I--------I---------I---------I
                 6.  I      1  I     19  I     14  I     34
  40-60 PCT          I    2.9  I   55.9  I   41.2  I   19.0
                     I    8.3  I   24.7  I   15.6  I
                     I     .6  I   10.6  I    7.8  I
                    -I--------I---------I---------I
                 8.  I      4  I     32  I     29  I     65
  60-80 PCT          I    6.2  I   49.2  I   44.6  I   36.3
                     I   33.3  I   41.6  I   32.2  I
                     I    2.2  I   17.9  I   16.2  I
                    -I--------I---------I---------I
                10.  I      2  I     14  I     40  I     56
  80-100 PCT         I    3.6  I   25.0  I   71.4  I   31.3
                     I   16.7  I   18.2  I   44.4  I
                     I    1.1  I    7.8  I   22.3  I
                    -I--------I---------I---------I
            COLUMN        12        77        90       179
             TOTAL       6.7      43.0      50.3     100.0

RAW CHI SQUARE =     23.54053 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0027
CRAMER#S V =     .25643
CONTINGENCY COEFFICIENT =      .34092
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WEARABILITY DATA ANALYSIS                                                                                01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * *  C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * *
    NV16                                                                    BY  NV13       IMAGE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      NV13
             COUNT  I
             ROW PCT I                                   ROW
             COL PCT I                                   TOTAL
             TOT PCT I      1.I       2.I       3.I
NV16        --------I--------I---------I--------I
                 2.  I      1  I      6  I      0  I      7
  0-20  PCT          I   14.3  I   85.7  I      0  I    4.2
                     I    5.3  I    4.7  I      0  I
                     I     .6  I    3.6  I      0  I
                    -I--------I---------I--------I
                 4.  I      2  I     10  I      2  I     14
  20-40 PCT          I   14.3  I   71.4  I   14.3  I    8.4
                     I   10.5  I    7.9  I    9.5  I
                     I    1.2  I    6.0  I    1.2  I
                    -I--------I---------I--------I
                 6.  I      4  I     25  I      3  I     32
  40-60 PCT          I   12.5  I   78.1  I    9.4  I   19.2
                     I   21.1  I   19.7  I   14.3  I
                     I    2.4  I   15.0  I    1.8  I
                    -I--------I---------I--------I
                 8.  I      5  I     51  I      6  I     62
  60-80 PCT          I    8.1  I   82.3  I    9.7  I   37.1
                     I   26.3  I   40.2  I   28.6  I
                     I    3.0  I   30.5  I    3.6  I
                    -I--------I---------I--------I
                10.  I      7  I     35  I     10  I     52
  80-100 PCT         I   13.5  I   67.3  I   19.2  I   31.1
                     I   36.8  I   27.6  I   47.6  I
                     I    4.2  I   21.0  I    6.0  I
                    -I--------I---------I--------I
             COLUMN       19       127        21      167
             TOTAL      11.4      76.0      12.6    100.0

RAW CHI SQUARE =      5.38767 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =     .7155
CRAMER#S V =      .12701
CONTINGENCY COEFFICIENT =      .17679

NUMBER OF MISSING OBSERVATIONS =        12
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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
     NV16                                                       BY  NV14       PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    NV14
           COUNT  I
          ROW PCT I                                   ROW
          COL PCT I                                   TOTAL
          TOT PCT I        1.I        2.I        3.I
NV16      --------I---------I---------I---------I
                2.  I      3  I      4  I      0  I      7
  0-20  PCT         I   42.9  I   57.1  I      0  I    4.0
                    I    4.1  I    6.3  I      0  I
                    I    1.7  I    2.3  I      0  I
                   -I---------I---------I---------I
                4.  I      7  I      7  I      0  I     14
  20-40 PCT         I   50.0  I   50.0  I      0  I    8.1
                    I    9.6  I   10.9  I      0  I
                    I    4.0  I    4.0  I      0  I
                   -I---------I---------I---------I
                6.  I     15  I     11  I      6  I     32
  40-60 PCT         I   46.9  I   34.4  I   18.8  I   18.5
                    I   20.5  I   17.2  I   16.7  I
                    I    8.7  I    6.4  I    3.5  I
                   -I---------I---------I---------I
                8.  I     29  I     18  I     17  I     64
  60-80 PCT         I   45.3  I   28.1  I   26.6  I   37.0
                    I   39.7  I   28.1  I   47.2  I
                    I   16.8  I   10.4  I    9.8  I
                   -I---------I---------I---------I
               10.  I     19  I     24  I     13  I     56
  80-100 PCT        I   33.9  I   42.9  I   23.2  I   32.4
                    I   26.0  I   37.5  I   36.1  I
                    I   11.0  I   13.9  I    7.5  I
                   -I---------I---------I---------I
            COLUMN        73        64        36       173
             TOTAL      42.2      37.0      20.8     100.0

RAW CHI SQUARE =     10.38088 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .2393
CRAMER#S V =      .17321
CONTINGENCY COEFFICIENT =      .23792

NUMBER OF MISSING OBSERVATIONS =        6
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WEARABILITY DATA ANALYSIS                                                                 01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
     NV16                                                       BY  V3          AGE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V3
              COUNT  I
            ROW PCT  I                                                      ROW
            COL PCT  I                                                      TOTAL
            TOT PCT  I     1.0I     2.0I     3.0I     4.0I     5.0I
NV16        ---------I--------I--------I--------I--------I--------I
                  2.  I      1 I      1 I      2 I      2 I      1 I      7
  0-20  PCT           I   14.3 I   14.3 I   28.6 I   28.6 I   14.3 I    4.1
                      I    3.4 I    2.2 I    5.1 I    5.7 I    4.3 I
                      I     .6 I     .6 I    1.2 I    1.2 I     .6 I
                     -I--------I--------I--------I--------I--------I
                  4.  I      4 I      5 I      2 I      2 I      1 I     14
  20-40 PCT           I   28.6 I   35.7 I   14.3 I   14.3 I    7.1 I    8.1
                      I   13.8 I   10.9 I    5.1 I    5.7 I    4.3 I
                      I    2.3 I    2.9 I    1.2 I    1.2 I     .6 I
                     -I--------I--------I--------I--------I--------I
                  6.  I     11 I      8 I      1 I      7 I      5 I     32
  40-60 PCT           I   34.4 I   25.0 I    3.1 I   21.9 I   15.6 I   18.6
                      I   37.9 I   17.4 I    2.6 I   20.0 I   21.7 I
                      I    6.4 I    4.7 I     .6 I    4.1 I    2.9 I
                     -I--------I--------I--------I--------I--------I
                  8.  I      9 I     16 I     17 I      9 I     13 I     64
  60-80 PCT           I   14.1 I   25.0 I   26.6 I   14.1 I   20.3 I   37.2
                      I   31.0 I   34.8 I   43.6 I   25.7 I   56.5 I
                      I    5.2 I    9.3 I    9.9 I    5.2 I    7.6 I
                     -I--------I--------I--------I--------I--------I
                 10.  I      4 I     16 I     17 I     15 I      3 I     55
  80-100 PCT          I    7.3 I   29.1 I   30.9 I   27.3 I    5.5 I   32.0
                      I   13.8 I   34.8 I   43.6 I   42.9 I   13.0 I
                      I    2.3 I    9.3 I    9.9 I    8.7 I    1.7 I
                     -I--------I--------I--------I--------I--------I
             COLUMN         29       46       39       35       23      172
             TOTAL        16.9     26.7     22.7     20.3     13.4    100.0

RAW CHI SQUARE =     27.81777 WITH     16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0332
CRAMER#S V =       .20108
CONTINGENCY COEFFICIENT =       .37312

NUMBER OF MISSING OBSERVATIONS =        7
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WEARABILITY DATA ANALYSIS                                                                                  11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * *  C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * *
    NV16                                                                 BY  V4        SEX
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V4
              COUNT  I
            ROW PCT  IMALE      FEMALE      ROW
            COL PCT  I                      TOTAL
            TOT PCT  I      1.0I      2.0I
NV16        ---------I---------I---------I
                  2.  I      6  I      2  I     8
  0-20  PCT           I   75.0  I   25.0  I   4.8
                      I    5.4  I    3.7  I
                      I    3.6  I    1.2  I
                     -I---------I---------I
                  4.  I      8  I      8  I    16
  20-40 PCT           I   50.0  I   50.0  I   9.6
                      I    7.1  I   14.8  I
                      I    4.8  I    4.8  I
                     -I---------I---------I
                  6.  I     22  I     12  I    34
  40-60 PCT           I   64.7  I   35.3  I  20.5
                      I   19.6  I   22.2  I
                      I   13.3  I    7.2  I
                     -I---------I---------I
                  8.  I     47  I     18  I    65
  60-80 PCT           I   72.3  I   27.7  I  39.2
                      I   42.0  I   33.3  I
                      I   28.3  I   10.8  I
                     -I---------I---------I
                 10.  I     29  I     14  I    43
  80-100 PCT          I   67.4  I   32.6  I  25.9
                      I   25.9  I   25.9  I
                      I   17.5  I    8.4  I
                     -I---------I---------I
             COLUMN        112        54       166
              TOTAL       67.5      32.5     100.0

RAW CHI SQUARE =      3.24304 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5180
CRAMER≠S V =      .13977
CONTINGENCY COEFFICIENT =     .13843

NUMBER OF MISSING OBSERVATIONS =       13
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WEARABILITY DATA ANALYSIS                                                                          11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
   NV16                                                              BY  NV6       BOATING SAFETY EDUCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     NV6
          COUNT  I                ONE OR
        ROW PCT  I                MORE       ROW
        COL PCT  I  NONE          COURSES    TOTAL
        TOT PCT  I          01         1.I
NV16    --------I---------I---------I
              2.  I      2  I      6  I      8
   0-20  PCT      I   25.0  I   75.0  I    4.8
                  I    3.6  I    5.4  I
                  I    1.2  I    3.6  I
                 -I---------I---------I
              4.  I      6  I     10  I     16
   20-40 PCT      I   37.5  I   62.5  I    9.6
                  I   10.9  I    8.9  I
                  I    3.6  I    6.0  I
                 -I---------I---------I
              6.  I     15  I     19  I     34
   40-60 PCT      I   44.1  I   55.9  I   20.4
                  I   27.3  I   17.0  I
                  I    9.0  I   11.4  I
                 -I---------I---------I
              8.  I     22  I     43  I     65
   60-80 PCT      I   33.8  I   66.2  I   38.9
                  I   40.0  I   38.4  I
                  I   13.2  I   25.7  I
                 -I---------I---------I
             10.  I     10  I     34  I     44
   80-100 PCT     I   22.7  I   77.3  I   26.3
                  I   18.2  I   30.4  I
                  I    6.0  I   20.4  I
                 -I---------I---------I
          COLUMN        55        112       167
           TOTAL      32.9       67.1     100.0

RAW CHI SQUARE =      4.40409 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3541
CRAMER≠S V =      .16239
CONTINGENCY COEFFICIENT =      .16029

NUMBER OF MISSING OBSERVATIONS =        12
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WEARABILITY DATA ANALYSIS                                                                        11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV16                                                               BY  V11       BOAT EXPER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V11
            COUNT  I
          ROW PCT  I20-100    100-500  GREATER    ROW
          COL PCT  I                   THEN 500  TOTAL
          TOT PCT  I     2.0I     3.0I     4.0I
NV16      --------I--------I--------I--------I
              2.  I      0 I      0 I      8 I      8
  0-20  PCT       I      0 I      0 I  100.0 I    4.8
                  I      0 I      0 I    5.8 I
                  I      0 I      0 I    4.8 I
                 -I--------I--------I--------I
              4.  I      0 I      2 I     14 I     16
  20-40 PCT       I      0 I   12.5 I   87.5 I    9.6
                  I      0 I    8.7 I   10.2 I
                  I      0 I    1.2 I    8.4 I
                 -I--------I--------I--------I
              6.  I      4 I      4 I     26 I     34
  40-60 PCT       I   11.8 I   11.8 I   76.5 I   20.4
                  I   57.1 I   17.4 I   19.0 I
                  I    2.4 I    2.4 I   15.6 I
                 -I--------I--------I--------I
              8.  I      3 I      9 I     53 I     65
  60-80 PCT       I    4.6 I   13.8 I   81.5 I   38.9
                  I   42.9 I   39.1 I   38.7 I
                  I    1.8 I    5.4 I   31.7 I
                 -I--------I--------I--------I
             10.  I      0 I      8 I     36 I     44
  80-100 PCT      I      0 I   18.2 I   81.8 I   26.3
                  I      0 I   34.8 I   26.3 I
                  I      0 I    4.8 I   21.6 I
                 -I--------I--------I--------I
           COLUMN        7       23      137      167
            TOTAL      4.2     13.8     82.0    100.0

RAW CHI SQUARE =      9.87522 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .2739
CRAMER*S V =      .17195
CONTINGENCY COEFFICIENT =      .23629

NUMBER OF MISSING OBSERVATIONS =       12
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WEARABILITY DATA ANALYSIS                                                                11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   NV16                                                            BY  V12        LOCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V12
         COUNT  I
       ROW PCT  IRIVER,CR SMALL LA WATERWAY CCEAN       ROW
       COL PCT  IEEK,ETC  KE        ,BAY,ETC            TOTAL
       TOT PCT  I     1.0I     2.0I     4.0I     5.0I
NV16   --------I--------I--------I--------I--------I
            2.  I     0  I     0  I     2  I     6  I      8
  0-20  PCT     I     0  I     0  I  25.0  I  75.0  I    4.9
                I     0  I     0  I   7.1  I   5.2  I
                I     0  I     0  I   1.2  I   3.7  I
               -I--------I--------I--------I--------I
            4.  I     0  I     0  I     1  I    15  I     16
  20-40 PCT     I     0  I     0  I   6.3  I  93.8  I    9.8
                I     0  I     0  I   3.6  I  12.9  I
                I     0  I     0  I    .6  I   9.2  I
               -I--------I--------I--------I--------I
            6.  I     0  I     3  I     5  I    26  I     34
  40-60 PCT     I     0  I   8.8  I  14.7  I  76.5  I   20.9
                I     0  I  16.7  I  17.9  I  22.4  I
                I     0  I   1.8  I   3.1  I  16.0  I
               -I--------I--------I--------I--------I
            8.  I     1  I     7  I    16  I    37  I     61
  60-80 PCT     I   1.6  I  11.5  I  26.2  I  60.7  I   37.4
                I 100.0  I  38.9  I  57.1  I  31.9  I
                I    .6  I   4.3  I   9.8  I  22.7  I
               -I--------I--------I--------I--------I
           10.  I     0  I     8  I     4  I    32  I     44
  80-100 PCT    I     0  I  18.2  I   9.1  I  72.7  I   27.0
                I     0  I  44.4  I  14.3  I  27.6  I
                I     0  I   4.9  I   2.5  I  19.6  I
               -I--------I--------I--------I--------I
        COLUMN        1       18       28      116     163
         TOTAL       .6     11.0     17.2     71.2   100.0

RAW CHI SQUARE =    14.87745 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =   .2482
CRAMER#S V =     .17443
CONTINGENCY COEFFICIENT =     .28920

NUMBER OF MISSING OBSERVATIONS =      16
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WEARABILITY DATA ANALYSIS                                                         11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
   NV16                                                              BY  V13       BOAT TYPE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                   V13
          COUNT   I
        ROW PCT  ICANOE     OTHER     SAIL      OPEN POW CABIN MO   ROW
        COL PCT  I                              ER       TORBOAT    TOTAL
        TOT PCT  I     1.0I     3.0I     4.0I     6.0I     7.0I
NV16    --------I--------I--------I--------I--------I--------I
             2.  I     0  I     0  I     2  I     2  I     4  I      8
  0-20  PCT      I     0  I     0  I  25.0  I  25.0  I  50.0  I    4.9
                 I     0  I     0  I   5.0  I   3.4  I   8.5  I
                 I     0  I     0  I   1.2  I   1.2  I   2.4  I
                -I--------I--------I--------I--------I--------I
             4.  I     0  I     0  I     8  I     2  I     6  I     16
  20-40 PCT      I     0  I     0  I  50.0  I  12.5  I  37.5  I    9.8
                 I     0  I     0  I  20.0  I   3.4  I  12.8  I
                 I     0  I     0  I   4.9  I   1.2  I   3.7  I
                -I--------I--------I--------I--------I--------I
             6.  I     3  I     0  I     8  I    13  I    10  I     34
  40-60 PCT      I   8.8  I     0  I  23.5  I  38.2  I  29.4  I   20.7
                 I  16.7  I     0  I  20.0  I  22.4  I  21.3  I
                 I   1.8  I     0  I   4.9  I   7.9  I   6.1  I
                -I--------I--------I--------I--------I--------I
             8.  I     7  I     1  I    17  I    20  I    19  I     64
  60-80 PCT      I  10.9  I   1.6  I  26.6  I  31.3  I  29.7  I   39.0
                 I  38.9  I 100.0  I  42.5  I  34.5  I  40.4  I
                 I   4.3  I    .6  I  10.4  I  12.2  I  11.6  I
                -I--------I--------I--------I--------I--------I
            10.  I     8  I     0  I     5  I    21  I     8  I     42
  80-100 PCT     I  19.0  I     0  I  11.9  I  50.0  I  19.0  I   25.6
                 I  44.4  I     0  I  12.5  I  36.2  I  17.0  I
                 I   4.9  I     0  I   3.0  I  12.8  I   4.9  I
                -I--------I--------I--------I--------I--------I
          COLUMN       18        1        40       58       47      164
           TOTAL     11.0       .6      24.4     35.4     28.7    100.0

RAW CHI SQUARE =     22.58519 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =   .1253
CRAMER≠S V =       .18555
CONTINGENCY COEFFICIENT =       .34792

NUMBER OF MISSING OBSERVATIONS =       15
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WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
   NV16                                                       BY  V14       BOAT LENGTH
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V14
            COUNT  I
          ROW PCT  ILT 16    16-20     20-26     GT 26      ROW
          COL PCT  I                                        TOTAL
          TOT PCT  I    1.0I     2.0I     3.0I     4.0I
NV16      ---------I--------I--------I--------I--------I
               2.  I     0  I     1  I     1  I     6  I      8
  0-20  PCT        I     0  I  12.5  I  12.5  I  75.0  I    5.3
                   I     0  I   2.0  I  10.0  I   8.0  I
                   I     0  I    .7  I    .7  I   3.9  I
                  -I--------I--------I--------I--------I
               4.  I     0  I     0  I     3  I    13  I     16
  20-40 PCT        I     0  I     0  I  18.8  I  81.3  I   10.5
                   I     0  I     0  I  30.0  I  17.3  I
                   I     0  I     0  I   2.0  I   8.6  I
                  -I--------I--------I--------I--------I
               6.  I     0  I    13  I     2  I    16  I     31
  40-60 PCT        I     0  I  41.9  I   6.5  I  51.6  I   20.4
                   I     0  I  26.0  I  20.0  I  21.3  I
                   I     0  I   8.6  I   1.3  I  10.5  I
                  -I--------I--------I--------I--------I
               8.  I     4  I    21  I     3  I    30  I     58
  60-80 PCT        I   6.9  I  36.2  I   5.2  I  51.7  I   38.2
                   I  23.5  I  42.0  I  30.0  I  40.0  I
                   I   2.6  I  13.8  I   2.0  I  19.7  I
                  -I--------I--------I--------I--------I
              10.  I    13  I    15  I     1  I    10  I     39
  80-100 PCT       I  33.3  I  38.5  I   2.6  I  25.6  I   25.7
                   I  76.5  I  30.0  I  10.0  I  13.3  I
                   I   8.6  I   9.9  I    .7  I   6.6  I
                  -I--------I--------I--------I--------I
           COLUMN       17       50       10       75      152
            TOTAL     11.2     32.9      6.6     49.3    100.0

RAW CHI SQUARE =    45.88500 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0000
CRAMER≠S V =     .31721
CONTINGENCY COEFFICIENT =      .48154

NUMBER OF MISSING OBSERVATIONS =       27
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WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   NV16                                                               BY  V29       CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V29
           COUNT  I
         ROW PCT  I75        50-75     10-50     1-10      NEVER      ROW
         COL PCT  I                                                   TOTAL
         TOT PCT  I     1.0I      2.0I      3.0I      4.0I      5.0I
NV16     --------I---------I---------I---------I---------I---------I
              2.  I      0  I      0  I      1  I      2  I      5  I      8
  0-20  PCT       I      0  I      0  I   12.5  I   25.0  I   62.5  I    4.8
                  I      0  I      0  I    2.3  I    4.7  I    8.8  I
                  I      0  I      0  I     .6  I    1.2  I    3.0  I
                 -I---------I---------I---------I---------I---------I
              4.  I      0  I      0  I      3  I      4  I      9  I     16
  20-40 PCT       I      0  I      0  I   18.8  I   25.0  I   56.3  I    9.6
                  I      0  I      0  I    7.0  I    9.3  I   15.8  I
                  I      0  I      0  I    1.8  I    2.4  I    5.4  I
                 -I---------I---------I---------I---------I---------I
              6.  I      6  I      0  I      6  I     10  I     12  I     34
  40-60 PCT       I   17.6  I      0  I   17.6  I   29.4  I   35.3  I   20.4
                  I   33.3  I      0  I   14.0  I   23.3  I   21.1  I
                  I    3.6  I      0  I    3.6  I    6.0  I    7.2  I
                 -I---------I---------I---------I---------I---------I
              8.  I      8  I      2  I     14  I     21  I     20  I     65
  60-80 PCT       I   12.3  I    3.1  I   21.5  I   32.3  I   30.8  I   38.9
                  I   44.4  I   33.3  I   32.6  I   48.8  I   35.1  I
                  I    4.8  I    1.2  I    8.4  I   12.6  I   12.0  I
                 -I---------I---------I---------I---------I---------I
             10.  I      4  I      4  I     19  I      6  I     11  I     44
  80-100 PCT      I    9.1  I    9.1  I   43.2  I   13.6  I   25.0  I   26.3
                  I   22.2  I   66.7  I   44.2  I   14.0  I   19.3  I
                  I    2.4  I    2.4  I   11.4  I    3.6  I    6.6  I
                 -I---------I---------I---------I---------I---------I
           COLUMN       18          6         43         43         57      167
            TOTAL     10.8        3.6       25.7       25.7       34.1    100.0

RAW CHI SQUARE =    26.78240 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =   .0440
CRAMER#S V =      .20023
CONTINGENCY COEFFICIENT =      .37176

NUMBER OF MISSING OBSERVATIONS =       12
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WEARABILITY DATA ANALYSIS                                                                  11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * *
   NV16                                                        BY  V54       FISHING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V54
             COUNT  I
           ROW PCT  I                    ROW
           COL PCT  I                    TOTAL
           TOT PCT  I      1.0I     2.0I
NV16       ---------I--------I--------I
                2.  I       0 I       8 I       8
  0-20  PCT         I       0 I   100.0 I     4.8
                    I       0 I     6.7 I
                    I       0 I     4.8 I
                   -I--------I--------I
                4.  I       2 I      14 I      16
  20-40 PCT         I    12.5 I    87.5 I     9.6
                    I     4.3 I    11.7 I
                    I     1.2 I     8.4 I
                   -I--------I--------I
                6.  I      12 I      22 I      34
  40-60 PCT         I    35.3 I    64.7 I    20.4
                    I    25.5 I    18.3 I
                    I     7.2 I    13.2 I
                   -I--------I--------I
                8.  I      16 I      49 I      65
  60-80 PCT         I    24.6 I    75.4 I    38.9
                    I    34.0 I    40.8 I
                    I     9.6 I    29.3 I
                   -I--------I--------I
               10.  I      17 I      27 I      44
  80-100 PCT        I    38.6 I    61.4 I    26.3
                    I    36.2 I    22.5 I
                    I    10.2 I    16.2 I
                   -I--------I--------I
            COLUMN        47      120       167
             TOTAL      28.1     71.9     100.0

RAW CHI SQUARE =      8.72467 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0684
CRAMER*S V =      .22857
CONTINGENCY COEFFICIENT =      .22282

NUMBER OF MISSING OBSERVATIONS =       12
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NEARABILITY DATA ANALYSIS                                                                              11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * */* * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   NV16                                                                     BY  V55       CANOEING OR KAYAKING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                          V55
               COUNT  I
             ROW PCT  I                      ROW
             COL PCT  I                      TOTAL
             TOT PCT  I      1.0I      2.0I
NV16         --------I---------I---------I
                   2.  I       0  I       8  I       8
  0-20  PCT            I       0  I   100.0  I     4.8
                       I       0  I     5.3  I
                       I       0  I     4.8  I
                      -I---------I---------I
                   4.  I       1  I      15  I      16
  20-40 PCT            I     6.3  I    93.8  I     9.6
                       I     6.7  I     9.9  I
                       I      .6  I     9.0  I
                      -I---------I---------I
                   6.  I       2  I      32  I      34
  40-60 PCT            I     5.9  I    94.1  I    20.4
                       I    13.3  I    21.1  I
                       I     1.2  I    19.2  I
                      -I---------I---------I
                   8.  I       6  I      59  I      65
  60-80 PCT            I     9.2  I    90.8  I    38.9
                       I    40.0  I    38.8  I
                       I     3.6  I    35.3  I
                      -I---------I---------I
                  10.  I       6  I      38  I      44
  80-100 PCT           I    13.6  I    86.4  I    26.3
                       I    40.0  I    25.0  I
                       I     3.6  I    22.8  I
                      -I---------I---------I
              COLUMN          15        152         167
               TOTAL         9.0       91.0       100.0

RAW CHI SQUARE =       2.50597 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .6436
CRAMER#S V =       .12250
CONTINGENCY COEFFICIENT =       .12159

NUMBER OF MISSING OBSERVATIONS =       12
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WEARABILITY DATA ANALYSIS                                                              11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * *
   NV16                                                            BY  V56       SKINDIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V56
           COUNT  I
         ROW PCT  I           ROW
         COL PCT  I           TOTAL
         TOT PCT  I      2.0I
NV16     ---------I--------I
              2.  I      8  I      8
  0-20  PCT       I  100.0  I    4.8
                  I    4.8  I
                  I    4.8  I
                 -I--------I
              4.  I     16  I     16
  20-40 PCT       I  100.0  I    9.6
                  I    9.6  I
                  I    9.6  I
                 -I--------I
              6.  I     34  I     34
  40-60 PCT       I  100.0  I   20.4
                  I   20.4  I
                  I   20.4  I
                 -I--------I
              8.  I     65  I     65
  60-80 PCT       I  100.0  I   38.9
                  I   38.9  I
                  I   38.9  I
                 -I--------I
             10.  I     44  I     44
  80-100 PCT      I  100.0  I   26.3
                  I   26.3  I
                 .I   26.3  I
                 -I--------I
          COLUMN       167       167
           TOTAL     100.0     100.0

NUMBER OF MISSING OBSERVATIONS =        12
```

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WEARABILITY DATA ANALYSIS                                                                   11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV16                                                          BY  V57        SCUBA DIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                        V57
              COUNT  I
              ROW PCT I                      ROW
              COL PCT I                      TOTAL
              TOT PCT I     1.0I      2.0I
NV16          --------I--------I--------I
                  2.  I      1  I      7  I      8
  0-20  PCT           I   12.5  I   87.5  I    4.8
                      I   50.0  I    4.2  I
                      I     .6  I    4.2  I
                     -I--------I--------I
                  4.  I      0  I     16  I     16
  20-40 PCT           I      0  I  100.0  I    9.6
                      I      0  I    9.7  I
                      I      0  I    9.6  I
                     -I--------I--------I
                  6.  I      1  I     33  I     34
  40-60 PCT           I    2.9  I   97.1  I   20.4
                      I   50.0  I   20.0  I
                      I     .6  I   19.8  I
                     -I--------I--------I
                  8.  I      0  I     65  I     65
  60-80 PCT           I      0  I  100.0  I   38.9
                      I      0  I   39.4  I
                      I      0  I   38.9  I
                     -I--------I--------I
                 10.  I      0  I     44  I     44
  80-100 PCT          I      0  I  100.0  I   26.3
                      I      0  I   26.7  I
                      I      0  I   26.3  I
                     -I--------I--------I
              COLUMN         2       165      167
               TOTAL       1.2      98.8    100.0

RAW CHI SQUARE =     11.02542 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0263
CRAMER≠S V =       .25694
CONTINGENCY COEFFICIENT =       .24886

NUMBER OF MISSING OBSERVATIONS =       12
```

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WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV16                                                                    BY  V58       SWIMMING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                          V58
             COUNT  I
             ROW PCT I                        ROW
             COL PCT I                        TOTAL
             TOT PCT I     1.0I      2.0I
NV16        --------I--------I--------I
                  2.  I     0  I     8  I      8
  0-20  PCT           I     0  I 100.0  I    4.8
                      I     0  I   4.8  I
                      I     0  I   4.8  I
                     -I--------I--------I
                  4.  I     0  I    16  I     16
  20-40 PCT           I     0  I 100.0  I    9.6
                      I     0  I   9.6  I
                      I     0  I   9.6  I
                     -I--------I--------I
                  6.  I     0  I    34  I     34
  40-60 PCT           I     0  I 100.0  I   20.4
                      I     0  I  20.5  I
                      I     0  I  20.4  I
                     -I--------I--------I
                  8.  I     0  I    65  I     65
  60-80 PCT           I     0  I 100.0  I   38.9
                      I     0  I  39.2  I
                      I     0  I  38.9  I
                     -I--------I--------I
                 10.  I     1  I    43  I     44
  80-100 PCT          I   2.3  I  97.7  I   26.3
                      I 100.0  I  25.9  I
                      I    .6  I  25.7  I
                     -I--------I--------I
               COLUMN       1      166      167
                TOTAL      .6     99.4    100.0

RAW CHI SQUARE =      2.81229 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5897
CRAMER≠S V =      .12977
CONTINGENCY COEFFICIENT =      .12869

NUMBER OF MISSING OBSERVATIONS =       12
```

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WEARABILITY DATA ANALYSIS                                                                       11/04/77      PAGE   92

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * *    C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NV16                                                               BY  V59        CAMPING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V59
             COUNT  I
             ROW PCT I            ROW
             COL PCT I            TOTAL
             TOT PCT I     2.0I
NV16         --------I--------I
                  2.  I      8  I      8
  0-20  PCT           I 100.0  I    4.8
                      I   4.8  I
                      I   4.8  I
                     -I--------I
                  4.  I     16  I     16
  20-40 PCT           I 100.0  I    9.6
                      I   9.6  I
                      I   9.6  I
                     -I--------I
                  6.  I     34  I     34
  40-60 PCT           I 100.0  I   20.4
                      I  20.4  I
                      I  20.4  I
                     -I--------I
                  8.  I     65  I     65
  60-80 PCT           I 100.0  I   38.9
                      I  38.9  I
                      I  38.9  I
                     -I--------I
                 10.  I     44  I     44
  80-100 PCT          I 100.0  I   26.3
                      I  26.3  I
                      I  26.3  I
                     -I--------I
            COLUMN       167       167
             TOTAL     100.0     100.0

NUMBER OF MISSING OBSERVATIONS =      12
```

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WEARABILITY DATA ANALYSIS                                                              11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NV16                                                         BY  V60        SAILING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V60
            COUNT   I
            ROW PCT I                      ROW
            COL PCT I                      TOTAL
            TOT PCT I      1.0I      2.0I
NV16        --------I--------I--------I
                 2.  I      2  I      6  I      8
  0-20  PCT          I   25.0  I   75.0  I    4.8
                     I   10.0  I    4.1  I
                     I    1.2  I    3.6  I
                    -I---------I---------I
                 4.  I      4  I     12  I     16
  20-40 PCT          I   25.0  I   75.0  I    9.6
                     I   20.0  I    8.2  I
                     I    2.4  I    7.2  I
                    -I---------I---------I
                 6.  I      4  I     30  I     34
  40-60 PCT          I   11.8  I   88.2  I   20.4
                     I   20.0  I   20.4  I
                     I    2.4  I   18.0  I
                    -I---------I---------I
                 8.  I      8  I     57  I     65
  60-80 PCT          I   12.3  I   87.7  I   38.9
                     I   40.0  I   38.8  I
                     I    4.8  I   34.1  I
                    -I---------I---------I
                10.  I      2  I     42  I     44
  80-100 PCT         I    4.5  I   95.5  I   26.3
                     I   10.0  I   28.6  I
                     I    1.2  I   25.1  I
                    -I---------I---------I
            COLUMN        20       147       167
            TOTAL       12.0      88.0     100.0

RAW CHI SQUARE =      6.17450 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1865
CRAMER≠S V =      .19228
CONTINGENCY COEFFICIENT =      .18882

NUMBER OF MISSING OBSERVATIONS =       12
```

```
WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PED

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NV16                                                                 BY  V61      WATER SKIING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                         V61
                 COUNT  I
                ROW PCT I                      ROW
                COL PCT I                      TOTAL
                TOT PCT I     1.0I      2.0I
NV16            --------I--------I---------I
                     2. I      0  I       8 I       8
  0-20  PCT             I      0  I   100.0 I     4.8
                        I      0  I     4.9 I
                        I      0  I     4.8 I
                       -I---------I---------I
                     4. I      0  I      16 I      16
  20-40 PCT             I      0  I   100.0 I     9.6
                        I      0  I     9.9 I
                        I      0  I     9.6 I
                       -I---------I---------I
                     6. I      1  I      33 I      34
  40-60 PCT             I    2.9  I    97.1 I    20.4
                        I   20.0  I    20.4 I
                        I     .6  I    19.8 I
                       -I---------I---------I
                     8. I      1  I      64 I      65
  60-80 PCT             I    1.5  I    98.5 I    38.9
                        I   20.0  I    39.5 I
                        I     .6  I    38.3 I
                       -I---------I---------I
                    10. I      3  I      41 I      44
  80-100 PCT            I    6.8  I    93.2 I    26.3
                        I   60.0  I    25.3 I
                        I    1.8  I    24.6 I
                       -I---------I---------I
                 COLUMN        5        162       167
                  TOTAL      3.0       97.0     100.0

RAW CHI SQUARE =       3.43073 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .4885
CRAMER#S V =      .14333
CONTINGENCY COEFFICIENT =      .14188

NUMBER OF MISSING OBSERVATIONS =       12
```

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WEARABILITY DATA ANALYSIS                                                                                 11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NV16                                                                BY  V62        PLEASURE CRUISING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V62
            COUNT   I
            ROW PCT I                     ROW
            COL PCT I                     TOTAL
            TOT PCT I     1.0I     2.0I
NV16        --------I--------I--------I
               2.   I      5 I      3 I       8
  0-20  PCT         I   62.5 I   37.5 I     4.8
                    I    6.4 I    3.4 I
                    I    3.0 I    1.8 I
                   -I--------I--------I
               4.   I      9 I      7 I      16
  20-40 PCT         I   56.3 I   43.8 I     9.6
                    I   11.5 I    7.9 I
                    I    5.4 I    4.2 I
                   -I--------I--------I
               6.   I     11 I     23 I      34
  40-60 PCT         I   32.4 I   67.6 I    20.4
                    I   14.1 I   25.8 I
                    I    6.6 I   13.8 I
                   -I--------I--------I
               8.   I     33 I     32 I      65
  60-80 PCT         I   50.8 I   49.2 I    38.9
                    I   42.3 I   36.0 I
                    I   19.8 I   19.2 I
                   -I--------I--------I
              10.   I     20 I     24 I      44
  80-100 PCT        I   45.5 I   54.5 I    26.3
                    I   25.6 I   27.0 I
                    I   12.0 I   14.4 I
                   -I--------I--------I
           COLUMN         78       89       167
           TOTAL        46.7     53.3     100.0

RAW CHI SQUARE =      4.65998 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3240
CRAMER#S V =     .16705
CONTINGENCY COEFFICIENT =      .16476

NUMBER OF MISSING OBSERVATIONS =       12
```

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WEARABILITY DATA ANALYSIS                                                                          11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV16                                                                BY  V63      RACING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V63
              COUNT  I
            ROW PCT  I              ROW
            COL PCT  I              TOTAL
            TOT PCT  I      2.0I
NV16         --------I---------I
                 2.  I      8  I      8
  0-20  PCT          I 100.0   I    4.8
                     I    4.8  I
                     I    4.8  I
                    -I---------I
                 4.  I     16  I     16
  20-40 PCT          I 100.0   I    9.6
                     I    9.6  I
                     I    9.6  I
                    -I---------I
                 6.  I     34  I     34
  40-60 PCT          I 100.0   I   20.4
                     I   20.4  I
                     I   20.4  I
                    -I---------I
                 8.  I     65  I     65
  60-80 PCT          I 100.0   I   38.9
                     I   38.9  I
                     I   38.9  I
                    -I---------I
                10.  I     44  I     44
  80-100 PCT         I 100.0   I   26.3
                     I   26.3  I
                     I   26.3  I
                    -I---------I
             COLUMN      167        167
              TOTAL    100.0      100.0

NUMBER OF MISSING OBSERVATIONS =        12
```

```
WEARABILITY DATA ANALYSIS                                                                          11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * *
    NV16                                                               BY  V64        HUNTING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V64
           COUNT  I
         ROW PCT  I              ROW
         COL PCT  I             TOTAL
         TOT PCT  I      2.0I
NV16     ---------I---------I
              2.  I      8  I       8
  0-20  PCT       I  100.0  I     4.8
                  I    4.8  I
                  I    4.8  I
                 -I---------I
              4.  I     16  I      16
  20-40 PCT       I  100.0  I     9.6
                  I    9.6  I
                  I    9.6  I
                 -I---------I
              6.  I     34  I      34
  40-60 PCT       I  100.0  I    20.4
                  I   20.4  I
                  I   20.4  I
                 -I---------I
              8.  I     65  I      65
  60-80 PCT       I  100.0  I    38.9
                  I   38.9  I
                  I   38.9  I
                 -I---------I
             10.  I     44  I      44
  80-100 PCT      I  100.0  I    26.3
                  I   26.3  I
                  I   26.3  I
                 -I---------I
          COLUMN       167        167
           TOTAL     100.0      100.0

NUMBER OF MISSING OBSERVATIONS =      12
```

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WEARABILITY DATA ANALYSIS                                                                11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
    NV16                                                             BY  V66        WATER CONDITIONS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V66
             COUNT  I
           ROW PCT  ICALM      CHOPPY    ROUGH OR   ROW
           COL PCT  I                      WHITE    TOTAL
           TOT PCT  I     1.0I      2.0I      3.0I
NV16       ---------I--------I---------I---------I
                2.  I     4  I     4   I     0   I     8
  0-20  PCT         I  50.0  I  50.0   I     0   I   4.8
                    I   7.3  I   4.5   I     0   I
                    I   2.4  I   2.4   I     0   I
                   -I--------I---------I---------I
                4.  I     5  I     9   I     2   I    16
  20-40 PCT         I  31.3  I  56.3   I  12.5   I   9.6
                    I   9.1  I  10.1   I   8.7   I
                    I   3.0  I   5.4   I   1.2   I
                   -I--------I---------I---------I
                6.  I    13  I    19   I     2   I    34
  40-60 PCT         I  38.2  I  55.9   I   5.9   I  20.4
                    I  23.6  I  21.3   I   8.7   I
                    I   7.8  I  11.4   I   1.2   I
                   -I--------I---------I---------I
                8.  I    21  I    31   I    13   I    65
  60-80 PCT         I  32.3  I  47.7   I  20.0   I  38.9
                    I  38.2  I  34.8   I  56.5   I
                    I  12.6  I  18.6   I   7.8   I
                   -I--------I---------I---------I
               10.  I    12  I    26   I     6   I    44
  80-100 PCT        I  27.3  I  59.1   I  13.6   I  26.3
                    I  21.8  I  29.2   I  26.1   I
                    I   7.2  I  15.6   I   3.6   I
                   -I--------I---------I---------I
            COLUMN       55       89        23       167
             TOTAL     32.9     53.3      13.8     100.0

RAW CHI SQUARE =      6.68114 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5714
CRAMER#S V =      .14143
CONTINGENCY COEFFICIENT =      .19613

NUMBER OF MISSING OBSERVATIONS =        12
```

```
WEARABILITY DATA ANALYSIS                                                          11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   NV16                                                       BY  V67        AIR TEMPERATURE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V67
            COUNT   I
            ROW PCT I40 OR L  51-60     61-70     71-80     81-90      ROW
            COL PCT I                                                  TOTAL
            TOT PCT I     1.0I      3.0I      4.0I      5.0I      6.0I
NV16        --------I--------I---------I---------I---------I---------I
                 2. I      0  I      0  I      5  I      3  I      0  I      8
  0-20  PCT         I      0  I      0  I   62.5  I   37.5  I      0  I    4.8
                    I      0  I      0  I    6.8  I    3.9  I      0  I
                    I      0  I      0  I    3.0  I    1.8  I      0  I
                   -I---------I---------I---------I---------I---------I
                 4. I      1  I      0  I      6  I      7  I      2  I     16
  20-40 PCT         I    6.3  I      0  I   37.5  I   43.8  I   12.5  I    9.6
                    I   20.0  I      0  I    8.2  I    9.2  I   22.2  I
                    I     .6  I      0  I    3.6  I    4.2  I    1.2  I
                   -I---------I---------I---------I---------I---------I
                 6. I      1  I      1  I     20  I     10  I      2  I     34
  40-60 PCT         I    2.9  I    2.9  I   58.8  I   29.4  I    5.9  I   20.4
                    I   20.0  I   25.0  I   27.4  I   13.2  I   22.2  I
                    I     .6  I     .6  I   12.0  I    6.0  I    1.2  I
                   -I---------I---------I---------I---------I---------I
                 8. I      3  I      3  I     25  I     32  I      2  I     65
  60-80 PCT         I    4.6  I    4.6  I   38.5  I   49.2  I    3.1  I   38.9
                    I   60.0  I   75.0  I   34.2  I   42.1  I   22.2  I
                    I    1.8  I    1.8  I   15.0  I   19.2  I    1.2  I
                   -I---------I---------I---------I---------I---------I
                10. I      0  I      0  I     17  I     24  I      3  I     44
  80-100 PCT        I      0  I      0  I   38.6  I   54.5  I    6.8  I   26.3
                    I      0  I      0  I   23.3  I   31.6  I   33.3  I
                    I      0  I      0  I   10.2  I   14.4  I    1.8  I
                   -I---------I---------I---------I---------I---------I
            COLUMN          5         4        73        76         9     167
             TOTAL        3.0       2.4      43.7      45.5       5.4   100.0

RAW CHI SQUARE =     14.74198 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .5436
CRAMER#S V =      .14856
CONTINGENCY COEFFICIENT =      .28481

NUMBER OF MISSING OBSERVATIONS =       12
```

```
WEARABILITY DATA ANALYSIS                                                            11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
     NV16                                                            BY  V68       WEATHER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                     V68
             COUNT  I
           ROW PCT  ISUNNY     CLOUDY      ROW
           COL PCT  I                      TOTAL
           TOT PCT  I    1.0I     2.0I
NV16       --------I--------I--------I
                2.  I     7  I     1  I      8
  0-20  PCT         I  87.5  I  12.5  I    4.8
                    I   5.4  I   2.8  I
                    I   4.2  I    .6  I
                   -I--------I--------I
                4.  I    14  I     2  I     16
  20-40 PCT         I  87.5  I  12.5  I    9.7
                    I  10.9  I   5.6  I
                    I   8.5  I   1.2  I
                   -I--------I--------I
                6.  I    24  I     9  I     33
  40-60 PCT         I  72.7  I  27.3  I   20.0
                    I  18.6  I  25.0  I
                    I  14.5  I   5.5  I
                   -I--------I--------I
                8.  I    48  I    16  I     64
  60-80 PCT         I  75.0  I  25.0  I   38.8
                    I  37.2  I  44.4  I
                    I  29.1  I   9.7  I
                   -I--------I--------I
               10.  I    36  I     8  I     44
  80-100 PCT        I  81.8  I  18.2  I   26.7
                    I  27.9  I  22.2  I
                    I  21.8  I   4.8  I
                   -I--------I--------I
            COLUMN      129       36       165
             TOTAL     78.2     21.8     100.0

RAW CHI SQUARE =      2.51817 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .6414
CRAMER≠S V =      .12354
CONTINGENCY COEFFICIENT =      .12261

NUMBER OF MISSING OBSERVATIONS =       14
```

```
WEARABILITY DATA ANALYSIS                                                                     11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV16                                                                 BY  V69        WIND
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    V69
            COUNT   I
          ROW PCT  ICALM     MODERATE STRONG      ROW
          COL PCT  I                              TOTAL
          TOT PCT  I     1.0I     2.0I     3.0I
NV16      --------I--------I--------I--------I
               2.  I      2 I      2 I      2 I      6
  0-20  PCT        I   33.3 I   33.3 I   33.3 I    4.2
                   I    4.3 I    2.2 I   25.0 I
                   I    1.4 I    1.4 I    1.4 I
                  -I--------I--------I--------I
               4.  I      2 I     10 I      1 I     13
  20-40 PCT        I   15.4 I   76.9 I    7.7 I    9.0
                   I    4.3 I   11.1 I   12.5 I
                   I    1.4 I    6.9 I     .7 I
                  -I--------I--------I--------I
               6.  I     12 I     15 I      3 I     30
  40-60 PCT        I   40.0 I   50.0 I   10.0 I   20.8
                   I   26.1 I   16.7 I   37.5 I
                   I    8.3 I   10.4 I    2.1 I
                  -I--------I--------I--------I
               8.  I     20 I     36 I      1 I     57
  60-80 PCT        I   35.1 I   63.2 I    1.8 I   39.6
                   I   43.5 I   40.0 I   12.5 I
                   I   13.9 I   25.0 I     .7 I
                  -I--------I--------I--------I
              10.  I     10 I     27 I      1 I     38
  80-100 PCT       I   26.3 I   71.1 I    2.6 I   26.4
                   I   21.7 I   30.0 I   12.5 I
                   I    6.9 I   18.8 I     .7 I
                  -I--------I--------I--------I
           COLUMN        46       90        8      144
            TOTAL      31.9     62.5      5.6    100.0

RAW CHI SQUARE =     16.30434 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .0382
CRAMER#S V =      .23793
CONTINGENCY COEFFICIENT =      .31892

NUMBER OF MISSING OBSERVATIONS =       35
```

APPENDIX III-B

Wearability/Accessibility Study Crosstabulations

Crosstabulation with NV 8

```
WEARABILITY DATA ANALYSIS                                                                  01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV8                                                            BY  NV9        ATTITUDE ON ACESS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     NV9
             COUNT  I
           ROW PCT  I                                  ROW
           COL PCT  I                                  TOTAL
           TOT PCT  I      1.I       2.I       3.I
NV8        ---------I--------I--------I--------I
                1.  I     3  I     3  I    20  I     26
  THRW AND EMRG WR  I  11.5  I  11.5  I  76.9  I   14.5
                    I  25.0  I   8.1  I  15.4  I
                    I   1.7  I   1.7  I  11.2  I
                   -I--------I--------I--------I
                2.  I     2  I    10  I    24  I     36
  WRBL BUT BLKY UN  I   5.6  I  27.8  I  66.7  I   20.1
                    I  16.7  I  27.0  I  18.5  I
                    I   1.1  I   5.6  I  13.4  I
                   -I--------I--------I--------I
                3.  I     3  I     2  I    14  I     19
  YOKE TYP INFLTBL  I  15.8  I  10.5  I  73.7  I   10.6
                    I  25.0  I   5.4  I  10.8  I
                    I   1.7  I   1.1  I   7.8  I
                   -I--------I--------I--------I
                4.  I     3  I    17  I    55  I     75
  VEST AND JACKETS  I   4.0  I  22.7  I  73.3  I   41.9
                    I  25.0  I  45.9  I  42.3  I
                    I   1.7  I   9.5  I  30.7  I
                   -I--------I--------I--------I
                5.  I     1  I     5  I    17  I     23
  BELT TYP          I   4.3  I  21.7  I  73.9  I   12.8
                    I   8.3  I  13.5  I  13.1  I
                    I    .6  I   2.8  I   9.5  I
                   -I--------I--------I--------I
            COLUMN        12        37       130      179
             TOTAL       6.7      20.7      72.6    100.0

RAW CHI SQUARE =      7.61258 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .4722
CRAMER#S V =      .14582
CONTINGENCY COEFFICIENT =      .20197
```

(171) (171)

```
WEARABILITY DATA ANALYSIS                                                        01/09/78

FILE   TED      (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * * * *  C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
    NV8                                                          BY  NV10       ATTWEAR ROUGH CD
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   NV10
           COUNT  I
         ROW PCT  I                     ROW
         COL PCT  I                     TOTAL
         TOT PCT  I     2.I      3.I
NV8      --------I--------I--------I
              1.  I      2 I      24 I     26
  THRW AND EMRG WR I    7.7 I    92.3 I   14.5
                  I   20.0 I    14.2 I
                  I    1.1 I    13.4 I
                 -I--------I--------I
              2.  I      1 I      35 I     36
  WRBL BUT BLKY UN I    2.8 I    97.2 I   20.1
                  I   10.0 I    20.7 I
                  I     .6 I    19.6 I
                 -I--------I--------I
              3.  I      3 I      16 I     19
  YOKE TYP INFLTBL I   15.8 I    84.2 I   10.6
                  I   30.0 I     9.5 I
                  I    1.7 I     8.9 I
                 -I--------I--------I
              4.  I      3 I      72 I     75
  VEST AND JACKETS I    4.0 I    96.0 I   41.9
                  I   30.0 I    42.6 I
                  I    1.7 I    40.2 I
                 -I--------I--------I
              5.  I      1 I      22 I     23
  BELT TYP        I    4.3 I    95.7 I   12.8
                  I   10.0 I    13.0 I
                  I     .6 I    12.3 I
                 -I--------I--------I
           COLUMN       10       169      179
            TOTAL      5.6      94.4    100.0

RAW CHI SQUARE =      4.93180 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =   .2944
CRAMER#S V =      .16599
CONTINGENCY COEFFICIENT =      .16375
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WEARABILITY DATA ANALYSIS                                                                    01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * * *    C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV8                                                              BY  NV11      ATTIT ON EFF-REL
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                      NV11
               COUNT  I
             ROW PCT  I                                   ROW
             COL PCT  I                                   TOTAL
             TOT PCT  I       1.I       2.I       3.I
NV8           --------I---------I---------I---------I
                  1.  I      7  I     16  I      2  I     25
  THRW AND EMRG WR    I   28.0  I   64.0  I    8.0  I   14.5
                      I   16.7  I   13.2  I   20.0  I
                      I    4.0  I    9.2  I    1.2  I
                     -I---------I---------I---------I
                  2.  I      8  I     26  I      1  I     35
  WRBL BUT BLKY UN    I   22.9  I   74.3  I    2.9  I   20.2
                      I   19.0  I   21.5  I   10.0  I
                      I    4.6  I   15.0  I     .6  I
                     -I---------I---------I---------I
                  3.  I      5  I     12  I      1  I     18
  YOKE TYP INFLTBL    I   27.8  I   66.7  I    5.6  I   10.4
                      I   11.9  I    9.9  I   10.0  I
                      I    2.9  I    6.9  I     .6  I
                     -I---------I---------I---------I
                  4.  I     17  I     52  I      4  I     73
  VEST AND JACKETS    I   23.3  I   71.2  I    5.5  I   42.2
                      I   40.5  I   43.0  I   40.0  I
                      I    9.8  I   30.1  I    2.3  I
                     -I---------I---------I---------I
                  5.  I      5  I     15  I      2  I     22
  BELT TYP            I   22.7  I   68.2  I    9.1  I   12.7
                      I   11.9  I   12.4  I   20.0  )
                      I    2.9  I    8.7  I    1.2  I
                     -I---------I---------I---------I
              COLUMN        42        121        10       173
               TOTAL      24.3       69.9       5.8     100.0

RAW CHI SQUARE =      1.74985 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .9877
CRAMER#S V =      .07112
CONTINGENCY COEFFICIENT =      .10007

NUMBER OF MISSING OBSERVATIONS =        0
```

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WEARABILITY DATA ANALYSIS                                                                        01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    NV8                                                        BY  NV12      NEED FOR PFD
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     NV12
              COUNT  I
            ROW PCT  I                                 ROW
            COL PCT  I                                 TOTAL
            TOT PCT  I       1.I       2.I       3.I
NV8         ---------I---------I---------I---------I
                  1. I       1 I      12 I      13 I      26
  THRW AND EMRG WR   I     3.8 I    46.2 I    50.0 I    14.5
                     I     8.3 I    15.6 I    14.4 I
                     I      .6 I     6.7 I     7.3 I
                    -I---------I---------I---------I
                  2. I       3 I      14 I      19 I      36
  WRBL BUT BLKY UN   I     8.3 I    38.9 I    52.8 I    20.1
                     I    25.0 I    18.2 I    21.1 I
                     I     1.7 I     7.8 I    10.6 I
                    -I---------I---------I---------I
                  3. I       1 I       7 I      11 I      19
  YOKE TYP INFLTBL   I     5.3 I    36.8 I    57.9 I    10.6
                     I     8.3 I     9.1 I    12.2 I
                     I      .6 I     3.9 I     6.1 I
                    -I---------I---------I---------I
                  4. I       5 I      33 I      37 I      75
  VEST AND JACKETS   I     6.7 I    44.0 I    49.3 I    41.9
                     I    41.7 I    42.9 I    41.1 I
                     I     2.8 I    18.4 I    20.7 I
                    -I---------I---------I---------I
                  5. I       2 I      11 I      10 I      23
  BELT TYP           I     8.7 I    47.8 I    43.5 I    12.8
                     I    16.7 I    14.3 I    11.1 I
                     I     1.1 I     6.1 I     5.6 I
                    -I---------I---------I---------I
             COLUMN         12        77        90       179
              TOTAL        6.7      43.0      50.3     100.0

RAW CHI SQUARE =      1.65459 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .9898
CRAMER≠S V =      .06798
CONTINGENCY COEFFICIENT =      .09570
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WEARABILITY DATA ANALYSIS                                                                       01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV8                                                                  BY  NV13       IMAGE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                         NV13
              COUNT   I
              ROW PCT I                                      ROW
              COL PCT I                                      TOTAL
              TOT PCT I        1.I        2.I        3.I
NV8           --------I---------I---------I---------I
                   1. I      3  I     17  I      2  I      22
   THRW AND EMRG WR   I   13.6  I   77.3  I    9.1  I    13.2
                      I   15.8  I   13.4  I    9.5  I
                      I    1.8  I   10.2  I    1.2  I
                     -I---------I---------I---------I
                   2. I      2  I     26  I      7  I      35
   WRBL BUT BLKY UN   I    5.7  I   74.3  I   20.0  I    21.0
                      I   10.5  I   20.5  I   33.3  I
                      I    1.2  I   15.6  I    4.2  I
                     -I---------I---------I---------I
                   3. I      2  I     12  I      3  I      17
   YOKE TYP INFLTBL   I   11.8  I   70.6  I   17.6  I    10.2
                      I   10.5  I    9.4  I   14.3  I
                      I    1.2  I    7.2  I    1.8  I
                     -I---------I---------I---------I
                   4. I     10  I     53  I      8  I      71
   VEST AND JACKETS   I   14.1  I   74.6  I   11.3  I    42.5
                      I   52.6  I   41.7  I   38.1  I
                      I    6.0  I   31.7  I    4.8  I
                     -I---------I---------I---------I
                   5. I      2  I     19  I      1  I      22
   BELT TYP           I    9.1  I   86.4  I    4.5  I    13.2
                      I   10.5  I   15.0  I    4.8  I
                      I    1.2  I   11.4  I     .6  I
                     -I---------I---------I---------I
               COLUMN       19        127         21       167
                TOTAL     11.4       76.0       12.6     100.0

RAW CHI SQUARE =      5.37648 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .7167
CRAMER≠S V =      .12687
CONTINGENCY COEFFICIENT =      .17661

NUMBER OF MISSING OBSERVATIONS =      12
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WEARABILITY DATA ANALYSIS                                                                            01/09/78

FILE   TED       (CREATION DATE =  01/09/78 )   COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NV8                                                            BY  NV14      PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    NV14
             COUNT  I
           ROW PCT  I                                   ROW
           COL PCT  I                                   TOTAL
           TOT PCT  I      1.I      2.I       3.I
NV8        ---------I--------I--------I---------I
                1.  I    11  I     9  I      4  I    24
   THRW AND EMRG WR I  45.8  I  37.5  I   16.7  I   13.9
                    I  15.1  I  14.1  I   11.1  I
                    I   6.4  I   5.2  I    2.3  I
                   -I--------I--------I---------I
                2.  I    14  I    13  I      8  I    35
   WRBL BUT BLKY UN I  40.0  I  37.1  I   22.9  I   20.2
                    I  19.2  I  20.3  I   22.2  I
                    I   8.1  I   7.5  I    4.6  I
                   -I--------I--------I---------I
                3.  I    10  I     4  I      3  I    17
   YOKE TYP INFLTBL I  58.8  I  23.5  I   17.6  I    9.8
                    I  13.7  I   6.3  I    8.3  I
                    I   5.8  I   2.3  I    1.7  I
                   -I--------I--------I---------I
                4.  I    28  I    30  I     16  I    74
   VEST AND JACKETS I  37.8  I  40.5  I   21.6  I   42.8
                    I  38.4  I  46.9  I   44.4  I
                    I  16.2  I  17.3  I    9.2  I
                   -I--------I--------I---------I
                5.  I    10  I     8  I      5  I    23
   BELT TYP         I  43.5  I  34.8  I   21.7  I   13.3
                    I  13.7  I  12.5  I   13.9  I
                    I   5.8  I   4.6  I    2.9  I
                   -I--------I--------I---------I
            COLUMN       73       64        36      173
             TOTAL     42.2     37.0      20.8    100.0

RAW CHI SQUARE =      3.07131 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =   .9298
CRAMER#S V =      .09422
CONTINGENCY COEFFICIENT =      .13207

NUMBER OF MISSING OBSERVATIONS =        6
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WEARABILITY DATA ANALYSIS                                                                        01/09/78

FILE    TED       (CREATION DATE =  01/09/78 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
     NV8                                                              BY  V3           AGE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                        V3
                COUNT  I
              ROW PCT  I                                                          ROW
              COL PCT  I                                                          TOTAL
              TOT PCT  I      1.0I      2.0I      3.0I      4.0I      5.0I
NV8            --------I---------I---------I---------I---------I---------I
                   1.  I     4   I     6   I     5   I     5   I     5   I     25
   THRW AND EMRG WR    I   16.0  I   24.0  I   20.0  I   20.0  I   20.0  I   14.5
                       I   13.8  I   13.0  I   12.8  I   14.3  I   21.7  I
                       I    2.3  I    3.5  I    2.9  I    2.9  I    2.9  I
                      -I---------I---------I---------I---------I---------I
                   2.  I     3   I    10   I     9   I     8   I     5   I     35
   WRBL BUT BLKY UN    I    8.6  I   28.6  I   25.7  I   22.9  I   14.3  I   20.3
                       I   10.3  I   21.7  I   23.1  I   22.9  I   21.7  I
                       I    1.7  I    5.8  I    5.2  I    4.7  I    2.9  I
                      -I---------I---------I---------I---------I---------I
                   3.  I     5   I     5   I     4   I     3   I     2   I     19
   YOKE TYP INFLTBL    I   26.3  I   26.3  I   21.1  I   15.8  I   10.5  I   11.0
                       I   17.2  I   10.9  I   10.3  I    8.6  I    8.7  I
                       I    2.9  I    2.9  I    2.3  I    1.7  I    1.2  I
                      -I---------I---------I---------I---------I---------I
                   4.  I    13   I    21   I    15   I    12   I     9   I     70
   VEST AND JACKETS    I   18.6  I   30.0  I   21.4  I   17.1  I   12.9  I   40.7
                       I   44.8  I   45.7  I   38.5  I   34.3  I   39.1  I
                       I    7.6  I   12.2  I    8.7  I    7.0  I    5.2  I
                      -I---------I---------I---------I---------I---------I
                   5.  I     4   I     4   I     6   I     7   I     2   I     23
   BELT TYP            I   17.4  I   17.4  I   26.1  I   30.4  I    8.7  I   13.4
                       I   13.8  I    8.7  I   15.4  I   20.0  I    8.7  I
                       I    2.3  I    2.3  I    3.5  I    4.1  I    1.2  I
                      -I---------I---------I---------I---------I---------I
                COLUMN       29        46        39        35        23        172
                 TOTAL     16.9      26.7      22.7      20.3      13.4      100.0

RAW CHI SQUARE =      7.28026 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .9675
CRAMER#S V =      .10287
CONTINGENCY COEFFICIENT =      .20151

NUMBER OF MISSING OBSERVATIONS =        7
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WEARABILITY DATA ANALYSIS                                                                  11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
     NV8                                                               BY  V4          SEX
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                     V4
              COUNT  I
            ROW PCT  IMALE      FEMALE      ROW
            COL PCT  I                      TOTAL
            TOT PCT  I     1.0I      2.0I
NV8         ---------I--------I--------I
                  1. I    18  I     7  I     25
  THRW AND EMRG WR   I  72.0  I  28.0  I   14.1
                     I  14.9  I  12.5  I
                     I  10.2  I   4.0  I
                    -I--------I--------I
                  2. I    23  I    13  I     36
  WRBL BUT BLKY UN   I  63.9  I  36.1  I   20.3
                     I  19.0  I  23.2  I
                     I  13.0  I   7.3  I
                    -I--------I--------I
                  3. I    12  I     7  I     19
  YOKE TYP INFLTBL   I  63.2  I  36.8  I   10.7
                     I   9.9  I  12.5  I
                     I   6.8  I   4.0  I
                    -I--------I--------I
                  4. I    53  I    21  I     74
  VEST AND JACKETS   I  71.6  I  28.4  I   41.8
                     I  43.8  I  37.5  I
                     I  29.9  I  11.9  I
                    -I--------I--------I
                  5. I    15  I     8  I     23
  BELT TYP           I  65.2  I  34.8  I   13.0
                     I  12.4  I  14.3  I
                     I   8.5  I   4.5  I
                    -I--------I--------I
             COLUMN      121       56       177
              TOTAL     68.4     31.6     100.0

RAW CHI SQUARE =      1.19262 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .8793
CRAMER*S V =      .08209
CONTINGENCY COEFFICIENT =      .08181

NUMBER OF MISSING OBSERVATIONS =        2
```

122   57.

FEMALE EVALUATIONS

60 - 3 = 57

↑

deleted

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WEARABILITY DATA ANALYSIS                                                              11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
    NV8                                                               BY  NV6   BOATING SAFETY EDUCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                        NV6
                                      ONE OR
                 COUNT  I             MORE
                 ROW PCT I   NONE     COURSES    ROW
                 COL PCT I                       TOTAL
                 TOT PCT I       0I        1.I
NV8             ---------I---------I---------I
                      1. I     4   I    21   I     25
  THRW AND EMRG WR I  16.0   I   84.0   I   14.0
                         I   7.1   I   17.2   I
                         I   2.2   I   11.8   I
                        -I---------I---------I
                      2. I    10   I    26   I     36
  WRBL BUT BLKY UN I  27.8   I   72.2   I   20.2
                         I  17.9   I   21.3   I
                         I   5.6   I   14.6   I
                        -I---------I---------I
                      3. I     7   I    12   I     19
  YOKE TYP INFLTBL I  36.8   I   63.2   I   10.7
                         I  12.5   I    9.8   I
                         I   3.9   I    6.7   I
                        -I---------I---------I
                      4. I    29   I    46   I     75
  VEST AND JACKETS I  38.7   I   61.3   I   42.1
                         I  51.8   I   37.7   I
                         I  16.3   I   25.8   I
                        -I---------I---------I
                      5. I     6   I    17   I     23
  BELT TYP               I  26.1   I   73.9   I   12.9
                         I  10.7   I   13.9   I
                         I   3.4   I    9.6   I
                        -I---------I---------I
                  COLUMN      56        122        178
                   TOTAL     31.5       68.5      100.0

RAW CHI SQUARE =      5.36707 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .2517
CRAMER≠S V =     .17364
CONTINGENCY COEFFICIENT =      .17108

NUMBER OF MISSING OBSERVATIONS =          1
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WEARABILITY DATA ANALYSIS                                                              11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   NV8                                                            BY  V11        BOAT EXPER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                  V11
           COUNT  I
         ROW PCT  I20-100    100-500  GREATER     ROW
         COL PCT  I                   THEN 500   TOTAL
         TOT PCT  I     2.0I     3.0I     4.0I
NV8      ---------I--------I--------I--------I
              1.  I     0  I     2  I    23  I     25
 THRW AND EMRG WR I     0  I   8.0  I  92.0  I   14.0
                  I     0  I   8.3  I  15.6  I
                  I     0  I   1.1  I  12.9  I
                 -I--------I--------I--------I
              2.  I     1  I     6  I    29  I     36
 WRBL BUT BLKY UN I   2.8  I  16.7  I  80.6  I   20.2
                  I  14.3  I  25.0  I  19.7  I
                  I    .6  I   3.4  I  16.3  I
                 -I--------I--------I--------I
              3.  I     3  I     3  I    13  I     19
 YOKE TYP INFLTBL I  15.8  I  15.8  I  68.4  I   10.7
                  I  42.9  I  12.5  I   8.8  I
                  I   1.7  I   1.7  I   7.3  I
                 -I--------I--------I--------I
              4.  I     2  I    11  I    62  I     75
 VEST AND JACKETS I   2.7  I  14.7  I  82.7  I   42.1
                  I  28.6  I  45.8  I  42.2  I
                  I   1.1  I   6.2  I  34.8  I
                 -I--------I--------I--------I
              5.  I     1  I     2  I    20  I     23
 BELT TYP         I   4.3  I   8.7  I  87.0  I   12.9
                  I  14.3  I   8.3  I  13.6  I
                  I    .6  I   1.1  I  11.2  I
                 -I--------I--------I--------I
          COLUMN        7       24      147      178
           TOTAL      3.9     13.5     82.6    100.0

RAW CHI SQUARE =     10.38628 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .2390
CRAMER#S V =      .17081
CONTINGENCY COEFFICIENT =      .23480

NUMBER OF MISSING OBSERVATIONS =        1
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WEARABILITY DATA ANALYSIS                                                                        11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV8                                                                BY  V12        LOCATION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V12
               COUNT  I
             ROW PCT  IRIVER,CR SMALL LA WATERWAY OCEAN        ROW
             COL PCT  IEEK,ETC  KE        ,BAY,ETC              TOTAL
             TOT PCT  I      1.0I      2.0I      4.0I      5.0I
NV8          ---------I---------I---------I---------I---------I
                  1.  I      0  I      0  I      5  I     20  I     25
 THRW AND EMRG WR     I      0  I      0  I   20.0  I   80.0  I   14.5
                      I      0  I      0  I   17.2  I   16.0  I
                      I      0  I      0  I    2.9  I   11.6  I
                     -I---------I---------I---------I---------I
                  2.  I      0  I      4  I      2  I     29  I     35
 WRBL BUT BLKY UN     I      0  I   11.4  I    5.7  I   82.9  I   20.2
                      I      0  I   22.2  I    6.9  I   23.2  I
                      I      0  I    2.3  I    1.2  I   16.8  I
                     -I---------I---------I---------I---------I
                  3.  I      0  I      0  I      4  I     14  I     18
 YOKE TYP INFLTBL     I      0  I      0  I   22.2  I   77.8  I   10.4
                      I      0  I      0  I   13.8  I   11.2  I
                      I      0  I      0  I    2.3  I    8.1  I
                     -I---------I---------I---------I---------I
                  4.  I      1  I     13  I     14  I     45  I     73
 VEST AND JACKETS     I    1.4  I   17.8  I   19.2  I   61.6  I   42.2
                      I  100.0  I   72.2  I   48.3  I   36.0  I
                      I     .6  I    7.5  I    8.1  I   26.0  I
                     -I---------I---------I---------I---------I
                  5.  I      0  I      1  I      4  I     17  I     22
 BELT TYP             I      0  I    4.5  I   18.2  I   77.3  I   12.7
                      I      0  I    5.6  I   13.8  I   13.6  I
                      I      0  I     .6  I    2.3  I    9.8  I
                     -I---------I---------I---------I---------I
              COLUMN         1        18        29       125      173
               TOTAL        .6      10.4      16.8      72.3    100.0

RAW CHI SQUARE =     15.79857 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =    .2006
CRAMER#S V =      .17447
CONTINGENCY COEFFICIENT =      .28927

NUMBER OF MISSING OBSERVATIONS =       6
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WEARABILITY DATA ANALYSIS                                                                                       11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *    C R O S S T A B U L A T I O N    O F  * * * * * * * * * * * * * * * * * * * *
    NV8                                                                 BY  V13         BOAT TYPE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V13
            COUNT   I
          ROW PCT  ICANOE      OTHER      SAIL      CPEN POW CABIN MO   ROW
          COL PCT  I                                ER       TORBOAT    TOTAL
          TOT PCT  I     1.0I      3.0I      4.0I      6.0I      7.0I
NV8       --------I--------I--------I--------I--------I--------I
               1.  I     0  I     0  I     5  I    11  I     8  I     24
  THRW AND EMRG WR I     0  I     0  I  20.8  I  45.8  I  33.3  I   13.7
                   I     0  I     0  I  11.4  I  18.3  I  15.4  I
                   I     0  I     0  I   2.9  I   6.3  I   4.6  I
                  -I--------I--------I--------I--------I--------I
               2.  I     4  I     0  I    13  I     7  I    12  I     36
  WRBL BUT BLKY UN I  11.1  I     0  I  36.1  I  19.4  I  33.3  I   20.6
                   I  22.2  I     0  I  29.5  I  11.7  I  23.1  I
                   I   2.3  I     0  I   7.4  I   4.0  I   6.9  I
                  -I--------I--------I--------I--------I--------I
               3.  I     0  I     0  I     2  I    10  I     6  I     18
  YOKE TYP INFLTBL I     0  I     0  I  11.1  I  55.6  I  33.3  I   10.3
                   I     0  I     0  I   4.5  I  16.7  I  11.5  I
                   I     0  I     0  I   1.1  I   5.7  I   3.4  I
                  -I--------I--------I--------I--------I--------I
               4.  I    13  I     1  I    19  I    23  I    18  I     74
  VEST AND JACKETS I  17.6  I   1.4  I  25.7  I  31.1  I  24.3  I   42.3
                   I  72.2  I 100.0  I  43.2  I  38.3  I  34.6  I
                   I   7.4  I    .6  I  10.9  I  13.1  I  10.3  I
                  -I--------I--------I--------I--------I--------I
               5.  I     1  I     0  I     5  I     9  I     8  I     23
  BELT TYP         I   4.3  I     0  I  21.7  I  39.1  I  34.8  I   13.1
                   I   5.6  I     0  I  11.4  I  15.0  I  15.4  I
                   I    .6  I     0  I   2.9  I   5.1  I   4.6  I
                  -I--------I--------I--------I--------I--------I
           COLUMN        18         1        44        60        52      175
            TOTAL      10.3        .6      25.1      34.3      29.7    100.0

RAW CHI SQUARE =     21.00227 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1784
CRAMER≠S V =      .17321
CONTINGENCY COEFFICIENT =      .32734

NUMBER OF MISSING OBSERVATIONS =        4
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WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
   NVB                                                             BY  V14        BOAT LENGTH
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                     V14
            COUNT   I
          ROW PCT  ILT 16      16-20      20-26     GT 26       ROW
          COL PCT  I                                            TOTAL
          TOT PCT  I    1.0I       2.0I       3.0I       4.0I
NVB       ---------I---------I---------I---------I---------I
               1.  I     2   I     6   I     2   I    11   I     21
  THRW AND EMRG WR I   9.5   I  28.6   I   9.5   I  52.4   I   13.2
                   I  11.1   I  11.8   I  18.2   I  13.9   I
                   I   1.3   I   3.8   I   1.3   I   6.9   I
                  -I---------I---------I---------I---------I
               2.  I     5   I     5   I     3   I    20   I     33
  WRBL BUT BLKY UN I  15.2   I  15.2   I   9.1   I  60.6   I   20.8
                   I  27.8   I   9.8   I  27.3   I  25.3   I
                   I   3.1   I   3.1   I   1.9   I  12.6   I
                  -I---------I---------I---------I---------I
               3.  I     2   I     6   I     2   I     6   I     16
  YOKE TYP INFLTBL I  12.5   I  37.5   I  12.5   I  37.5   I   10.1
                   I  11.1   I  11.8   I  18.2   I   7.6   I
                   I   1.3   I   3.8   I   1.3   I   3.8   I
                  -I---------I---------I---------I---------I
               4.  I     7   I    27   I     3   I    32   I     69
  VEST AND JACKETS I  10.1   I  39.1   I   4.3   I  46.4   I   43.4
                   I  38.9   I  52.9   I  27.3   I  40.5   I
                   I   4.4   I  17.0   I   1.9   I  20.1   I
                  -I---------I---------I---------I---------I
               5.  I     2   I     7   I     1   I    10   I     20
  BELT TYP         I  10.0   !  35.0   I   5.0   I  50.0   I   12.6
                   I  11.1   I  13.7   I   9.1   I  12.7   I
                   I   1.3   I   4.4   I    .6   I   6.3   I
                  -I---------I---------I---------I---------I
            COLUMN        18        51        11        79      159
            TOTAL       11.3      32.1       6.9      49.7    100.0

RAW CHI SQUARE =      8.29088 WITH    12 DEGREES OF FREEDOM.  SIGNIFICANCE =    .7620
CRAMER#S V =      .13184
CONTINGENCY COEFFICIENT =      .22262

NUMBER OF MISSING OBSERVATIONS =       20
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WEARABILITY DATA ANALYSIS                                                              11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     NV8                                                          BY  V29        CUSTOMRY PFD WEAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

               V29
        COUNT  I
      ROW PCT  I75        50-75     10-50     1-10      NEVER      ROW
      COL PCT  I                                                   TOTAL
      TOT PCT  I    1.0I      2.0I      3.0I      4.0I      5.0I
NV8   --------I--------I---------I---------I---------I---------I
           1.  I     2  I      0  I      6  I      7  I     10  I    25
 THRW AND EMRG WR I   8.0  I      0  I   24.0  I   28.0  I   40.0  I  14.0
               I  11.1  I      0  I   13.0  I   14.9  I   16.4  I
               I   1.1  I      0  I    3.4  I    3.9  I    5.6  I
              -I--------I---------I---------I---------I---------I
           2.  I        I      1  I     11  I     11  I     10  I  . 36
 WRBL BUT BLKY UN I   8.3  I    2.8  I   30.6  I   30.6  I   27.8  I  20.2
               I  16.7  I   16.7  I   23.9  I   23.4  I   16.4  I
               I   1.7  I     .6  I    6.2  I    6.2  I    5.6  I
              -I--------I---------I---------I---------I---------I
           3.  I     2  I      0  I      5  I      3  I      9  I    19
 YOKE TYP INFLTBL I  10.5  I      0  I   26.3  I   15.8  I   47.4  I  10.7
               I  11.1  I      0  I   10.9  I    6.4  I   14.8  I
               I   1.1  I      0  I    2.8  I    1.7  I    5.1  I
              -I--------I---------I---------I---------I---------I
           4.  I     9  I      4  I     19  I     19  I     24  I    75
 VEST AND JACKETS I  12.0  I    5.3  I   25.3  I   25.3  I   32.0  I  42.1
               I  50.0  I   66.7  I   41.3  I   40.4  I   39.3  I
               I   5.1  I    2.2  I   10.7  I   10.7  I   13.5  I
              -I--------I---------I---------I---------I---------I
           5.  I     2  I      1  I      5  I      7  I      8  I    23
 BELT TYP      I   8.7  I    4.3  I   21.7  I   30.4  I   34.8  I  12.9
               I  11.1  I   16.7  I   10.9  I   14.9  I   13.1  I
               I   1.1  I     .6  I    2.8  I    3.9  I    4.5  I
              -I--------I---------I---------I---------I---------I
        COLUMN       18          6         46         47         61      178
         TOTAL     10.1        3.4       25.8       26.4       34.3    100.0

RAW CHI SQUARE =     6.47221 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .9821
CRAMER*S V =     .09534
CONTINGENCY COEFFICIENT =      .18731

NUMBER OF MISSING OBSERVATIONS =        1
```

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WEARABILITY DATA ANALYSIS                                                                          11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV8                                                             BY  V54       FISHING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                      V54
               COUNT  I
             ROW PCT  I                     ROW
             COL PCT  I   YES      NO       TOTAL
             TOT PCT  I    1.0I     2.0I
NV8          ---------I--------I--------I
                  1.  I      5 I     20 I      25
   THRW AND EMRG WR   I   20.0 I   80.0 I    14.0
                      I   10.2 I   15.5 I
                      I    2.8 I   11.2 I
                     -I--------I--------I
                  2.  I      7 I     29 I      36
   WRBL BUT BLKY UN   I   19.4 I   80.6 I    20.2
                      I   14.3 I   22.5 I
                      I    3.9 I   16.3 I
                     -I--------I--------I
                  3.  I      4 I     15 I      19
   YOKE TYP INFLTBL   I   21.1 I   78.9 I    10.7
                      I    8.2 I   11.6 I
                      I    2.2 I    8.4 I
                     -I--------I--------I
                  4.  I     25 I     50 I      75
   VEST AND JACKETS   I   33.3 I   66.7 I    42.1
                      I   51.0 I   38.8 I
                      I   14.0 I   28.1 I
                     -I--------I--------I
                  5.  I      8 I     15 I      23
   BELT TYP           I   34.8 , I   65.2 I    12.9
                      I   16.3 I   11.6 I
                      I    4.5 I    8.4 I
                     -I--------I--------I
              COLUMN        49      129       178
               TOTAL      27.5     72.5     100.0

RAW CHI SQUARE =      4.16235 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =   .3845
CRAMER≠S V =      .15292
CONTINGENCY COEFFICIENT =      .15116

NUMBER OF MISSING OBSERVATIONS =        1
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WEARABILITY DATA ANALYSIS                                                          11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV8                                                              BY  V55        CANOEING OR KAYAKING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                   V55
           COUNT  I
          ROW PCT I                     ROW
          COL PCT I                     TOTAL
          TOT PCT I     1.0I     2.0I
NV8       --------I--------I--------I
              1.  I     0  I    25  I    25
  THRW AND EMRG WR I     0  I 100.0  I  14.0
                  I     0  I  15.4  I
                  I     0  I  14.0  I
                 -I--------I--------I
              2.  I     4  I    32  I    36
  WRBL BUT BLKY UN I  11.1  I  88.9  I  20.2
                  I  25.0  I  19.8  I
                  I   2.2  I  18.0  I
                 -I--------I--------I
              3.  I     0  I    19  I    19
  YOKE TYP INFLTBL I     0  I 100.0  I  10.7
                  I     0  I  11.7  I
                  I     0  I  10.7  I
                 -I--------I--------I
              4.  I    10  I    65  I    75
  VEST AND JACKETS I  13.3  I  86.7  I  42.1
                  I  62.5  I  40.1  I
                  I   5.6  I  36.5  I
                 -I--------I--------I
              5.  I     2  I    21  I    23
  BELT TYP        I   8.7  I  91.3  I  12.9
                  I  12.5  I  13.0  I
                  I   1.1  I  11.8  I
                 -I--------I--------I
          COLUMN        16       162       178
           TOTAL       9.0      91.0     100.0

RAW CHI SQUARE =      6.27676 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1794
CRAMER≠S V =      .18778
CONTINGENCY COEFFICIENT =      .18456

NUMBER OF MISSING OBSERVATIONS =        1
```

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WEARABILITY DATA ANALYSIS                                                                          11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
     NV8                                                               BY  V56        SKINDIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V56
             COUNT  I
           ROW PCT  I             ROW
           COL PCT  I             TOTAL
           TOT PCT  I      2.0I
NV8        ---------I---------I
                1.  I     25  I     25
  THRW AND EMRG WR  I  100.0  I   14.0
                    I   14.0  I
                    I   14.0  I
                   -I---------I
                2.  I     36  I     36
  WRBL BUT BLKY UN  I  100.0  I   20.2
                    I   20.2  I
                    I   20.2  I
                   -I---------I
                3.  I     19  I     19
  YOKE TYP INFLTBL  I  100.0  I   10.7
                    I   10.7  I
                    I   10.7  I
                   -I---------I
                4.  I     75  I     75
  VEST AND JACKETS  I  100.0  I   42.1
                    I   42.1  I
                    I   42.1  I
                   -I---------I
                5.  I     23  I     23
  BELT TYP          I  100.0  I   12.9
                    I   12.9  I
                    I   12.9  I
                   -I---------I
            COLUMN       178       178
             TOTAL     100.0     100.0

NUMBER OF MISSING OBSERVATIONS =        1
```

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WEARABILITY DATA ANALYSIS                                                                        11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F  * * * * * * * * * * * * * * * * * * * *
   NV8                                                              BY  V57        SCUBA DIVING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V57
           COUNT  I
         ROW PCT  I                          ROW
         COL PCT  I                          TOTAL
         TOT PCT  I      1.0I       2.0I
NV8      ---------I---------I---------I
              1.  I       0  I      25  I      25
  THRW AND EMRG WR I       0  I   100.0  I    14.0
                  I       0  I    14.2  I
                  I       0  I    14.0  I
                 -I---------I---------I
              2.  I       1  I      35  I      36
  WRBL BUT BLKY UN I     2.8  I    97.2  I    20.2
                  I    50.0  I    19.9  I
                  I      .6  I    19.7  I
                 -I---------I---------I
              3.  I       1  I      18  I      19
  YOKE TYP INFLTBL I     5.3  I    94.7  I    10.7
                  I    50.0  I    10.2  I
                  I      .6  I    10.1  I
                 -I---------I---------I
              4.  I       0  I      75  I      75
  VEST AND JACKETS I       0  I   100.0  I    42.1
                  I       0  I    42.6  I
                  I       0  I    42.1  I
                 -I---------I---------I
              5.  I       0  I      23  I      23
  BELT TYP        I       0  I   100.0  I    12.9
                  I       0  I    13.1  I
                  I       0  I    12.9  I
                 -I---------I---------I
           COLUMN         2        176       178
            TOTAL       1.1       98.9     100.0

RAW CHI SQUARE =      5.21503 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .2659
CRAMER#S V =      .17117
CONTINGENCY COEFFICIENT =      .16871

NUMBER OF MISSING OBSERVATIONS =        1
```

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[illegible] DATA ANALYSIS                                                              11/04/77

FILE  TED        (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * * * *
    NVB                                                         BY  V58        SWIMMING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V58
              COUNT  I
            ROW PCT  I                      ROW
            COL PCT  I                      TOTAL
            TOT PCT  I     1.0I     2.0I
NVB         ---------I--------I--------I
                  1. I      0 I     25 I     25
   FHRW AND EMRG WR  I      0 I  100.0 I   14.0
                     I      0 I   14.1 I
                     I      0 I   14.0 I
                    -I--------I--------I
                  2. I      0 I     36 I     36
   WRBL HUT BLKY UN  I      0 I  100.0 I   20.2
                     I      0 I   20.3 I
                     I      0 I   20.2 I
                    -I--------I--------I
                  3. I      0 I     19 I     19
   YOKE TYP INFLTBL  I      0 I  100.0 I   10.7
                     I      0 I   10.7 I
                     I      0 I   10.7 I
                    -I--------I--------I
                  4. I      1 I     74 I     75
   VEST AND JACKETS  I    1.3 I   98.7 I   42.1
                     I  100.0 I   41.8 I
                     I     .6 I   41.6 I
                    -I--------I--------I
                  5. I      0 I     23 I     23
   BELT TYP          I      0 I  100.0 I   12.9
                     I      0 I   13.0 I
                     I      0 I   12.9 I
                    -I--------I--------I
             COLUMN         1      177      178
              TOTAL        .6     99.4    100.0

RAW CHI SQUARE =      1.38109 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =   .8475
CRAMER*S V =      .08408
CONTINGENCY COEFFICIENT =      .08775

NUMBER OF MISSING OBSERVATIONS =        1
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WEARABILITY DATA ANALYSIS                                                                      11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   NV8                                                                    BY  V59       CAMPING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *   PAGE  1 OF  1

                      V59
             COUNT  I
             ROW PCT I            ROW
             COL PCT I           TOTAL
             TOT PCT I     2.01
NV8         ---------I---------I
                  1.  I    25   I     25
  THRW AND EMRG WR I 100.0  I   14.0
                      I   14.0  I
                      I   14.0  I
                     -I---------I
                  2.  I    36   I     36
  WRBL BUT BLKY UN I 100.0  I   20.2
                      I   20.2  I
                      I   20.2  I
                     -I---------I
                  3.  I    19   I     19
  YOKE TYP INFLTBL I 100.0  I   10.7
                      I   10.7  I
                      I   10.7  I
                     -I---------I
                  4.  I    75   I     75
  VEST AND JACKETS I 100.0  I   42.1
                      I   42.1  I
                      I   42.1  I
                     -I---------I
                  5.  I    23   I     23
  BELT TYP            I 100.0  I   12.9
                      I   12.9  I
                      I   12.9  I
                     -I---------I
             COLUMN       178        178
              TOTAL     100.0      100.0

NUMBER OF MISSING OBSERVATIONS =        1
```

```
WEARABILITY DATA ANALYSIS                                                            11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   NV8                                                                   BY  V60        SAILING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                          V60
               COUNT  I
             ROW PCT  I                            ROW
             COL PCT  I                            TOTAL
             TOT PCT  I      1.0I      2.0I
NV8           --------I--------I--------I
                  1.  I      1  I     24  I     25
   THRW AND EMRG WR I    4.0  I   96.0  I   14.0
                      I    5.0  I   15.2  I
                      I     .6  I   13.5  I
                     -I--------I--------I
                  2.  I      8  I     28  I     36
   WRBL BUT BLKY UN I   22.2  I   77.8  I   20.2
                      I   40.0  I   17.7  I
                      I    4.5  I   15.7  I
                     -I--------I--------I
                  3.  I      2  I     17  I     19
   YOKE TYP INFLTBL I   10.5  I   89.5  I   10.7
                      I   10.0  I   10.8  I
                      I    1.1  I    9.6  I
                     -I--------I--------I
                  4.  I      7  I     68  I     75
   VEST AND JACKETS I    9.3  I   90.7  I   42.1
                      I   35.0  I   43.0  I
                      I    3.9  I   38.2  I
                     -I--------I--------I
                  5.  I      2  I     21  I     23
   BELT TYP           I    8.7  I   91.3  I   12.9
                      I   10.0  I   13.3  I
                      I    1.1  I   11.8  I
                     -I--------I--------I
              COLUMN        20        158       178
               TOTAL      11.2       88.8     100.0

RAW CHI SQUARE =      6.09977 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .1918
CRAMER#S V =     .18512
CONTINGENCY COEFFICIENT =      .18202

NUMBER OF MISSING OBSERVATIONS =       1
```

```
WEARABILITY DATA ANALYSIS                                                                              11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
   NV8                                                                  BY  V61         WATER SKIING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                        V61
               COUNT  I
             ROW PCT  I                          ROW
             COL PCT  I                          TOTAL
             TOT PCT  I      1.0I      2.0I
NV8          --------I---------I---------I
                  1.  I      0  I     25  I     25
   THRW AND EMRG WR  I      0  I  100.0  I   14.0
                      I      0  I   14.5  I
                      I      0  I   14.0  I
                     -I---------I---------I
                  2.  I      2  I     34  I     36
   WRBL BUT BLKY UN  I    5.6  I   94.4  I   20.2
                      I   33.3  I   19.8  I
                      I    1.1  I   19.1  I
                     -I---------I---------I
                  3.  I      0  I     19  I     19
   YOKE TYP INFLTBL  I      0  I  100.0  I   10.7
                      I      0  I   11.0  I
                      I      0  I   10.7  I
                     -I---------I---------I
                  4.  I      3  I     72  I     75
   VEST AND JACKETS  I    4.0  I   96.0  I   42.1
                      I   50.0  I   41.9  I
                      I    1.7  I   40.4  I
                     -I---------I---------I
                  5.  I      1  I     22  I     23
   BELT TYP           I    4.3  I   95.7  I   12.9
                      I   16.7  I   12.8  I
                      I     .6  I   12.4  I
                     -I---------I---------I
              COLUMN         6        172       178
               TOTAL       3.4       96.6     100.0

RAW CHI SQUARE =     2.22102 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .6952
CRAMER≠S V =      .11170
CONTINGENCY COEFFICIENT =      .11101

NUMBER OF MISSING OBSERVATIONS =        1
```

```
WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE    TED        (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
     NV8                                                             BY  V62       PLEASURE CRUISING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                        V62
             COUNT  I
           ROW PCT  I                       ROW
           COL PCT  I                       TOTAL
           TOT PCT  I      1.0I      2.0I
NV8        ---------I---------I---------I
                1.  I    15   I    10   I    25
   THRW AND EMRG WR I  60.0   I  40.0   I  14.0
                    I  18.5   I  10.3   I
                    I   8.4   I   5.6   I
                   -I---------I---------I
                2.  I    16   I    20   I    36
   WRBL BUT BLKY UN I  44.4   I  55.6   I  20.2
                    I  19.8   I  20.6   I
                    I   9.0   I  11.2   I
                   -I---------I---------I
                3.  I    10   I     9   I    19
   YOKE TYP INFLTBL I  52.6   I  47.4   I  10.7
                    I  12.3   I   9.3   I
                    I   5.6   I   5.1   I
                   -I---------I---------I
                4.  I    30   I    45   I    75
   VEST AND JACKETS I  40.0   I  60.0   I  42.1
                    I  37.0   I  46.4   I
                    I  16.9   I  25.3   I
                   -I---------I---------I
                5.  I    10   I    13   I    23
   BELT TYP         I  43.5   I  56.5   I  12.9
                    I  12.3   I  13.4   I
                    I   5.6   I   7.3   I
                   -I---------I---------I
            COLUMN       81        97        178
             TOTAL     45.5      54.5      100.0

RAW CHI SQUARE =     3.47828 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .4812
CRAMER≠S V =      .13979
CONTINGENCY COEFFICIENT =      .13844

NUMBER OF MISSING OBSERVATIONS =        1
```

```
WEARABILITY DATA ANALYSIS                                                        11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   NV8                                                          BY  V63      RACING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                       V63
             COUNT  I
           ROW PCT  I            ROW
           COL PCT  I           TOTAL
           TOT PCT  I     2.0I
NV8        ---------I--------I
                 1. I     25  I     25
  THRW AND EMRG WR  I 100.0  I   14.0
                    I  14.0  I
                    I  14.0  I
                   -I--------I
                 2. I     36  I     36
  WRBL BUT BLKY UN  I 100.0  I   20.2
                    I  20.2  I
                    I  20.2  I
                   -I--------I
                 3. I     19  I     19
  YOKE TYP INFLTBL  I 100.0  I   10.7
                    I  10.7  I
                    I  10.7  I
                   -I--------I
                 4. I     75  I     75
  VEST AND JACKETS  I 100.0  I   42.1
                    I  42.1  I
                    I  42.1  I
                   -I--------I
                 5. I     23  I     23
  BELT TYP          I 100.0  I   12.9
                    I  12.9  I
                    I  12.9  I
                   -I--------I
            COLUMN       178       178
             TOTAL     100.0     100.0

NUMBER OF MISSING OBSERVATIONS =        1
```

```
WEARABILITY DATA ANALYSIS                                                                        11/04/77

FILE    TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   NV8                                                                BY  V64       HUNTING
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE  1 OF  1

                    V64
           COUNT  I
         ROW PCT  I            ROW
         COL PCT  I            TOTAL
         TOT PCT  I      2.0I
NV8      ---------I---------I
              1.  I    25   I     25
 THRW AND EMRG WR I  100.0  I   14.0
                  I   14.0  I
                  I   14.0  I
                 -I---------I
              2.  I    36   I     36
 WRBL BUT BLKY UN I  100.0  I   20.2
                  I   20.2  I
                  I   20.2  I
                 -I---------I
              3.  I    19   I     19
 YOKE TYP INFLTBL I  100.0  I   10.7
                  I   10.7  I
                  I   10.7  I
                 -I---------I
              4.  I    75   I     75
 VEST AND JACKETS I  100.0  I   42.1
                  I   42.1  I
                  I   42.1  I
                 -I---------I
              5.  I    23   I     23
 BELT TYP         I  100.0  I   12.9
                  I   12.9  I
                  I   12.9  I
                 -I---------I
          COLUMN       178        178
           TOTAL     100.0      100.0

NUMBER OF MISSING OBSERVATIONS =        1
```

```
WEARABILITY DATA ANALYSIS                                                                     11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
   NV8                                                               BY  V66       WATER CONDITIONS
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                         V66
                COUNT  I
              ROW PCT  ICALM      CHOPPY    ROUGH OR    ROW
              COL PCT  I                     WHITE      TOTAL
              TOT PCT  I     1.0I     2.0I     3.0I
NV8           ---------I--------I--------I--------I
                    1. I      8 I     16 I      1 I     25
   THRW AND EMRG WR  I   32.0 I   64.0 I    4.0 I   14.0
                       I   14.8 I   16.0 I    4.2 I
                       I    4.5 I    9.0 I     .6 I
                      -I--------I--------I--------I
                    2. I     10 I     22 I      4 I     36
   WRBL BUT BLKY UN  I   27.8 I   61.1 I   11.1 I   20.2
                       I   18.5 I   22.0 I   16.7 I
                       I    5.6 I   12.4 I    2.2 I
                      -I--------I--------I--------I
                    3. I      4 I     10 I      5 I     19
   YOKE TYP INFLTBL  I   21.1 I   52.6 I   26.3 I   10.7
                       I    7.4 I   10.0 I   20.8 I
                       I    2.2 I    5.6 I    2.8 I
                      -I--------I--------I--------I
                    4. I     22 I     41 I     12 I     75
   VEST AND JACKETS  I   29.3 I   54.7 I   16.0 I   42.1
                       I   40.7 I   41.0 I   50.0 I
                       I   12.4 I   23.0 I    6.7 I
                      -I--------I--------I--------I
                    5, I     10 I     11 I      2 I     23
   BELT TYP            I   43.5 I   47.8 I    8.7 I   12.9
                       I   18.5 I   11.0 I    8.3 I
                       I    5.6 I    6.2 I    1.1 I
                      -I--------I--------I--------I
               COLUMN        54      100       24      178
                TOTAL      30.3     56.2     13.5    100.0

RAW CHI SQUARE =      7.64295 WITH     8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .4691
CRAMER≠S V =       .14652
CONTINGENCY COEFFICIENT =      .20290

NUMBER OF MISSING OBSERVATIONS =        1
```

```
WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE   TED      (CREATION DATE =  11/04/77 )   COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    NV8                                                                BY  V67        AIR TEMPERATURE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                    V67
             COUNT  I
           ROW PCT  I40 OR L  51-60     61-70     71-80     81-90      ROW
           COL PCT  I                                                  TOTAL
           TOT PCT  I     1.0I     3.0I     4.0I     5.0I     6.0I
NV8        --------I--------I--------I--------I--------I--------I
                1.  I     0  I     1  I    13  I    10  I     1  I     25
  THRW AND EMRG WR  I     0  I   4.0  I  52.0  I  40.0  I   4.0  I   14.0
                    I     0  I  25.0  I  16.9  I  12.0  I  11.1  I
                    I     0  I    .6  I   7.3  I   5.6  I    .6  I
                   -I--------I--------I--------I--------I--------I
                2.  I     1  I     1  I    18  I    15  I     1  I     36
  WRBL BUT BLKY UN  I   2.8  I   2.8  I  50.0  I  41.7  I   2.8  I   20.2
                    I  20.0  I  25.0  I  23.4  I  18.1  I  11.1  I
                    I    .6  I    .6  I  10.1  I   8.4  I    .6  I
                   -I--------I--------I--------I--------I--------I
                3.  I     1  I     0  I     9  I     9  I     0  I     19
  YOKE TYP INFLTBL  I   5.3  I     0  I  47.4  I  47.4  I     0  I   10.7
                    I  20.0  I     0  I  11.7  I  10.8  I     0  I
                    I    .6  I     0  I   5.1  I   5.1  I     0  I
                   -I--------I--------I--------I--------I--------I
                4.  I     2  I     2  I    29  I    36  I     6  I     75
  VEST AND JACKETS  I   2.7  I   2.7  I  38.7  I  48.0  I   8.0  I   42.1
                    I  40.0  I  50.0  I  37.7  I  43.4  I  66.7  I
                    I   1.1  I   1.1  I  16.3  I  20.2  I   3.4  I
                   -I--------I--------I--------I--------I--------I
                5.  I     1  I     0  I     8  I    13  I     1  I     23
  BELT TYP          I   4.3  I     0  I  34.8  I  56.5  I   4.3  I   12.9
                    I  20.0  I     0  I  10.4  I  15.7  I  11.1  I
                    I    .6  I     0  I   4.5  I   7.3  I    .6  I
                   -I--------I--------I--------I--------I--------I
            COLUMN        5        4       77       83        9      178
             TOTAL      2.8      2.2     43.3     46.6      5.1    100.0

RAW CHI SQUARE =     7.97470 WITH    16 DEGREES OF FREEDOM.  SIGNIFICANCE =    .9496
CRAMER≠S V =     .10583
CONTINGENCY COEFFICIENT =     .20708

NUMBER OF MISSING OBSERVATIONS =        1
```

```
WEARABILITY DATA ANALYSIS                                                                        11/04/77

FILE   TED       (CREATION DATE =  11/04/77 )    COLL PFD

* * * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    NV8                                                                BY  V68          WEATHER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   V68
            COUNT  I
          ROW PCT ISUNNY    CLOUDY      ROW
          COL PCT I                     TOTAL
          TOT PCT I      1.0I     2.0I
NV8       --------I--------I--------I
               1. I     18 I      7 I     25
  THRW AND EMRG WR I   72.0 I   28.0 I   14.2
                  I   13.2 I   17.5 I
                  I   10.2 I    4.0 I
                 -I--------I--------I
               2. I     30 I      5 I     35
  WRBL BUT BLKY UN I   85.7 I   14.3 I   19.9
                  I   22.1 I   12.5 I
                  I   17.0 I    2.8 I
                 -I--------I--------I
               3. I     15 I      4 I     19
  YOKE TYP INFLTBL I   78.9 I   21.1 I   10.8
                  I   11.0 I   10.0 I
                  I    8.5 I    2.3 I
                 -I--------I--------I
               4. I     55 I     19 I     74
  VEST AND JACKETS I   74.3 I   25.7 I   42.0
                  I   40.4 I   47.5 I
                  I   31.3 I   10.8 I
                 -I--------I--------I
               5. I     18 I      5 I     23
  BELT TYP        I   78.3 I   21.7 I   13.1
                  I   13.2 I   12.5 I
                  I   10.2 I    2.8 I
                 -I--------I--------I
           COLUMN      136       40      176
            TOTAL     77.3     22.7    100.0

RAW CHI SQUARE =      2.22536 WITH      4 DEGREES OF FREEDOM.  SIGNIFICANCE =    .6944
CRAMER≠S V =      .11245
CONTINGENCY COEFFICIENT =      .11174

NUMBER OF MISSING OBSERVATIONS =       3
```

```
WEARABILITY DATA ANALYSIS                                                                    11/04/77

FILE    TFD       (CREATION DATE =  11/04/77 )    DOLL PFD

* * * * * * * * * * * * * * * * * * * *    C R O S S T A B U L A T I O N    O F   * * * * * * * * * * * * * * * * * * * * *
     NV8                                                                   BY  V69        WIND
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                      V69
             COUNT   I
            ROW PCT  ICALM      MODERATE STRONG      ROW
            COL PCT  I                               TOTAL
            TOT PCT  I      1.0I      2.0I      3.0I
NV8         ---------I---------I---------I---------I
                  1. I      5  I     15  I      2  I    22
  THRW AND EMRG WR   I   22.7  I   68.2  I    9.1  I  14.1
                     I   10.9  I   14.7  I   25.0  I
                     I    3.2  I    9.6  I    1.3  I
                    -I---------I---------I---------I
                  2. I     10  I     21  I      1  I    32
  WRBL BUT BLKY UN   I   31.3  I   65.6  I    3.1  I  20.5
                     I   21.7  I   20.6  I   12.5  I
                     I    6.4  I   13.5  I     .6  I
                    -I---------I---------I---------I
                  3. I      4  I     11  I      3  I    18
  YOKE TYP INFLTBL   I   22.2  I   61.1  I   16.7  I  11.5
                     I    8.7  I   10.8  I   37.5  I
                     I    2.6  I    7.1  I    1.9  I
                    -I---------I---------I---------I
                  4. I     19  I     42  I      2  I    63
  VEST AND JACKETS   I   30.2  I   66.7  I    3.2  I  40.4
                     I   41.3  I   41.2  I   25.0  I
                     I   12.2  I   26.9  I    1.3  I
                    -I---------I---------I---------I
                  5. I      8  I     13  I      0  I    21
  BELT TYP           I   38.1  I   61.9  I      0  I  13.5
                     I   17.4  I   12.7  I      0  I
                     I    5.1  I    8.3  I      0  I
                    -I---------I---------I---------I
             COLUMN        46        102          8     156
             TOTAL       29.5       65.4        5.1   100.0

RAW CHI SQUARE =      8.50873 WITH      8 DEGREES OF FREEDOM.  SIGNIFICANCE =    .3854
CRAMER≠S V =      .16514
CONTINGENCY COEFFICIENT =      .22742

NUMBER OF MISSING OBSERVATIONS =       23
```

SECTION V - APPENDICES

DEVELOPMENT OF RELIABILITY TEST METHODOLOGY FOR PFDS

●	APPENDIX V(A)-A	Review of Factors Relevant to Establishing A Methodology for Determining The Reliability of PFDs
●	APPENDIX V(A)-B	Plans, Procedures, and Techniques for Accelerated Aging and Reliability Assessment of Inherently Buoyant PFDs
●	APPENDIX V(A)-C	Factors Affecting PFD Buoyancy

APPENDIX V(A)-A

WYLE LABORATORIES
MARINE TECHNOLOGY STAFF
TECHNICAL BRIEF 77-03

REVIEW OF FACTORS RELEVANT TO ESTABLISHING A METHODOLOGY FOR DETERMINING THE RELIABILITY OF PFDs

By

Michael J. Pfauth

February 1977

Work Performed Under Contract DOT-CG-42333-A

Delivery Order No. DOT-CG-70529-A

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AD-A058 739 WYLE LABS HUNTSVILLE ALA F/G 6/7
PERSONAL FLOTATION DEVICES RESEARCH. VOLUME 3. APPENDICES.(U)
JAN 78 T DOLL, M PFAUTH, J GLEASON, S COHEN DOT-CG-42333-A
UNCLASSIFIED MSR 78-1-VOL-3 USCG-D-41-78-VOL-3 NL

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REVIEW OF FACTORS RELEVANT TO ESTABLISHING A METHODOLOGY FOR DETERMINING THE RELIABILITY OF PFDs

1. INTRODUCTION AND OUTLINE OF RELIABILITY PROBLEMS

The development of reliability engineering as a separate discipline has increased rapidly in recent years. The development of this discipline was necessary in order to obtain the high degree of reliability required by space-age systems. Most work in the area of reliability has centered on determining the reliability of hardware systems. It is our intent to apply the techniques and metholdolgy developed by reliability engineering to the problem of reliability of PFDs.

The problem of determining the reliability of a PFD is an extremely complex one. The issue is complicated by a multitude of factors. The major ones are outlined as follows:

1. Current requirements for PFDs are not defined in terms of the intended mission of the PFD. PFDs are now required to provide 15.5 lb (7.03 kg) of buoyancy (Type IIs and IIIs) for a period of 24 hours (48 hours for fibrous buoyant materials). Little justification could be found for these requirements nor could a consensus be found among other users of PFDs (FAA and foreign countries) as to what are justifiable requirements for a PFD. In order for an accurate prediction of the reliability of a PFD to be made, the intended mission of the PFD must be accurately defined.

2. The definition of a PFD failure should be as consistent as possible with the definition of what constitutes a reliable PFD. The criteria for designing a reliable PFD should be able to reflect the PFD reliability definition. Some results on the testing of kapok PFDs (References 9 and 15) have suggested some design guidelines for kapok PFDs.

3. Any program for developing a reliability methodology must take into account the large number of factors. For instance, the design of a methodology for predicting the reliability of a PFD using foam as a buoyancy medium could be noticeably different from the methodology used for kapok PFDs. This would be due not only to the construction and material differences but to the different types of usage each might receive. In order to be meaningful, reliability tests must reflect normal use conditions and characteristics of that particular PFD. In order to do this, it is necessary to define the requirements of the PFD in terms of mission anduseful life criteria and then design the reliability tests accordingly. This view is supported by W. Yurkowsky, an expert in the field of reliability engineering.

> "Stresses that will not be experienced during actual use or which will change the physical state of a product's materials could but will not likely yield meaningful results." (Reference 1)

4. In order for test procedures to be used to qualify a product for reliability, these test procedures must be able to predict the performance of a product after a period of usage. Quality control testing is designed to determine whether a product meets a set of specifications. It is not intended to be used to predict the reliability of a product. A clear distinction must be made between these two concepts.

5. Very little information could be found on the subject of accelerated aging of PFDs. The information discovered was found to be weak in types of tests used and in the development of correlations with normal aging. The importance of having valid engineering assumptions in accelerated aging is underscored again by Yurkowsky.

> "Sound engineering assumptions are required in order to select stresses and stress levels which will most likely result in the specification of a valid accelerated test method." (Reference 1)

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2.0 OBJECTIVES

The objective of this literature review is to provide a background on which to build a reliability program for PFDs. The long-term goal for reliability is in being able to provide a criteria and methodology that will be used by manufacturers in providing the recreational boating public with a safe and effective PFD. A number of areas are to be reviewed for relevant information. These areas can be defined as follows:

1. An extensive review of possible PFD reliability definitions and information relevant to these definitions in order to arrive at a consensus as to the definition of a reliable PFD.
2. A review of past work to determine the important stressors on PFDs and the subsequent PFD failure modes.
3. A review of currently used reliability test procedures in an attempt to evaluate the validity of these tests.
4. A review of any PFD accelerated aging that has been done previously, an evaluation of the validity of this work, and the application of any meaningful results to Wyle's accelerated aging program.
5. A review of accelerated aging methodologies currently available for possible use in Wyle's accelerated aging program.

Figure 1 shows how this information will feed into the reliability program.

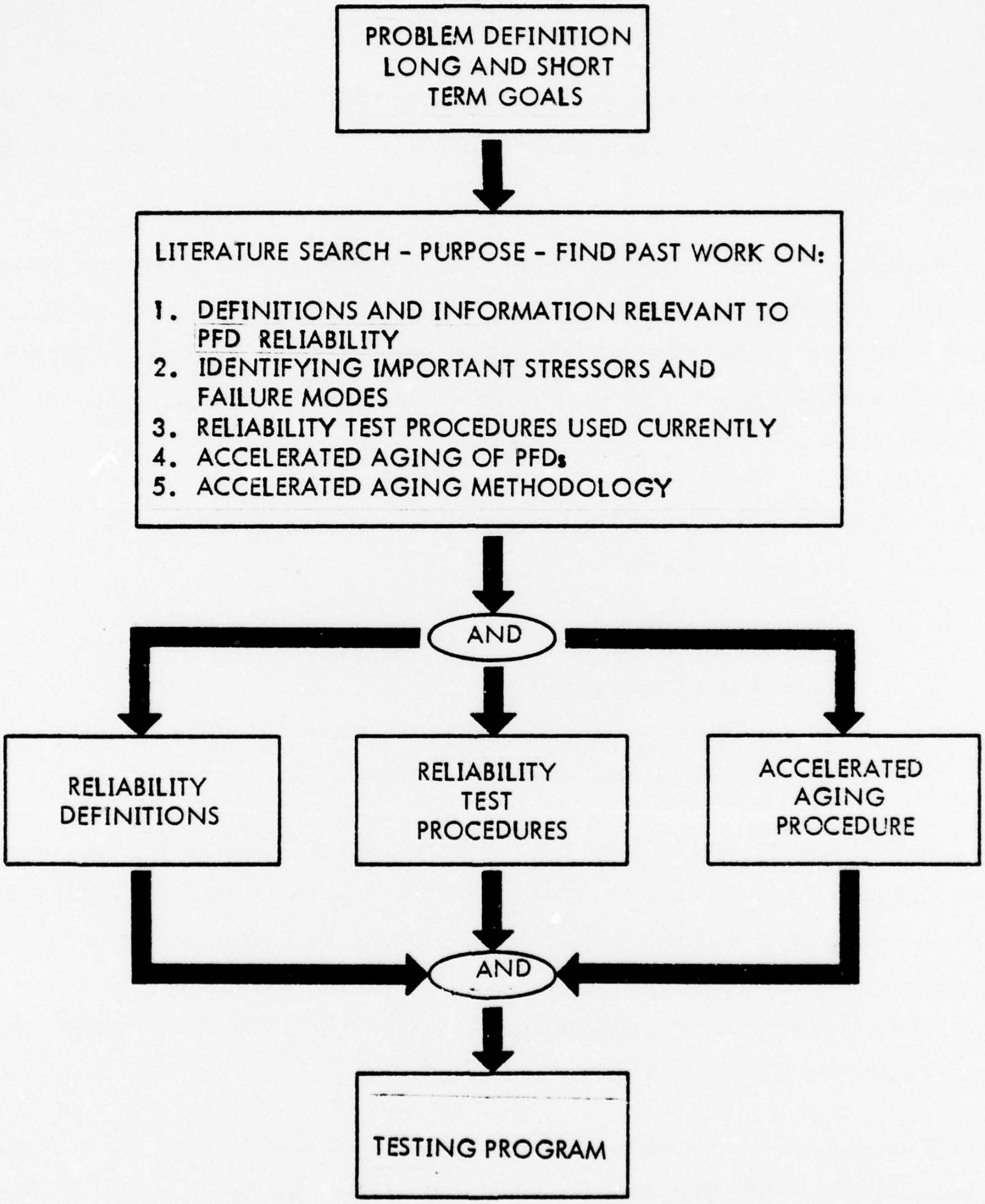
PROBLEM DEFINITION
LONG AND SHORT TERM GOALS
LITERATURE SEARCH - PURPOSE - FIND PAST WORK ON:
1. DEFINITIONS AND INFORMATION RELEVANT TO PFD RELIABILITY
2. IDENTIFYING IMPORTANT STRESSORS AND FAILURE MODES
3. RELIABILITY TEST PROCEDURES USED CURRENTLY
4. ACCELERATED AGING OF PFDs
5. ACCELERATED AGING METHODOLOGY
AND
RELIABILITY DEFINITIONS
RELIABILITY TEST PROCEDURES
ACCELERATED AGING PROCEDURE
AND
TESTING PROGRAM

FIGURE 1. PFD RELIABILITY INFORMATION INPUT.

3.0 PFD RELIABILITY DEFINITION

In general, the reliability of a device is the probability that it will operate successfully for a specified period of time and under specified conditions when used in the manner and for the purpose intended.

A more specific definition * of PFD reliability can be derived from this general definition. Reliability of a PFD is the probability that the PFD will provide sufficient buoyancy (TBD ** pounds of buoyancy) to support 95% of the male population, fully clothed, under less than ideal conditions for a period of ten hours and be able to provide such support for a minimum of TBD years.

From this definition, it can be seen that several areas need to be considered. Three questions in particular need to be answered:

1. How much minimum buoyancy is required of a PFD to protect a certain percentage of the population?
2. For how long should the PFD provide this buoyancy (mission requirement)?
3. What should the useful life of the PFD be?

The current buoyancy requirement of 15.5 lb (7.03 kg) for Type II and III PFDs has evolved as a result of various trade-offs between wearability and effectiveness of a PFD. The Type II PFD was derived from the Type I PFD by decreasing the buoyancy requirement in order to increase wearability. In order to formulate a useful definition of reliability, the minimum buoyancy requirement must be based upon a consideration of PFD effectiveness alone, rather than a compromise between effectiveness and wearability.

The buoyancy requirements necessary to support various portions of the population are reported in Booz and Allen (1968) (Reference 2). While this data has been cited in Booz and Allen (1968),

---

* This report will deal with the reliability of adult PFDs only (> 90 lb (40.82 kg)). Even though medium and child size PFDs are not dealt with in this report, the logic for deriving the reliability of smaller size PFDs would be virtually the same.

** To Be Determined

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it was taken from a 1946 study performed by Mellon Institute of Industrial Research (Fellowship No. 316B-1). Figure 2 shows the buoyancy requirements for various percentages of the adult male population. The adult male population was chosen as this represents the "worst case condition." In Figure 2, the two lines represent necessary buoyancy requirements for two conditions; the basic requirement for a non-clothed individual under ideal conditions (non-stressful) and the requirements for a clothed individual under less than ideal conditions. Booz and Allen recommend that an additional five pounds (2.27 kg) of buoyancy be required to account for clothing and that an additional one to two and one-half pounds (0.45-1.13 kg) buoyancy be added to account for the effects of increased exhalation due to panic or exertion.

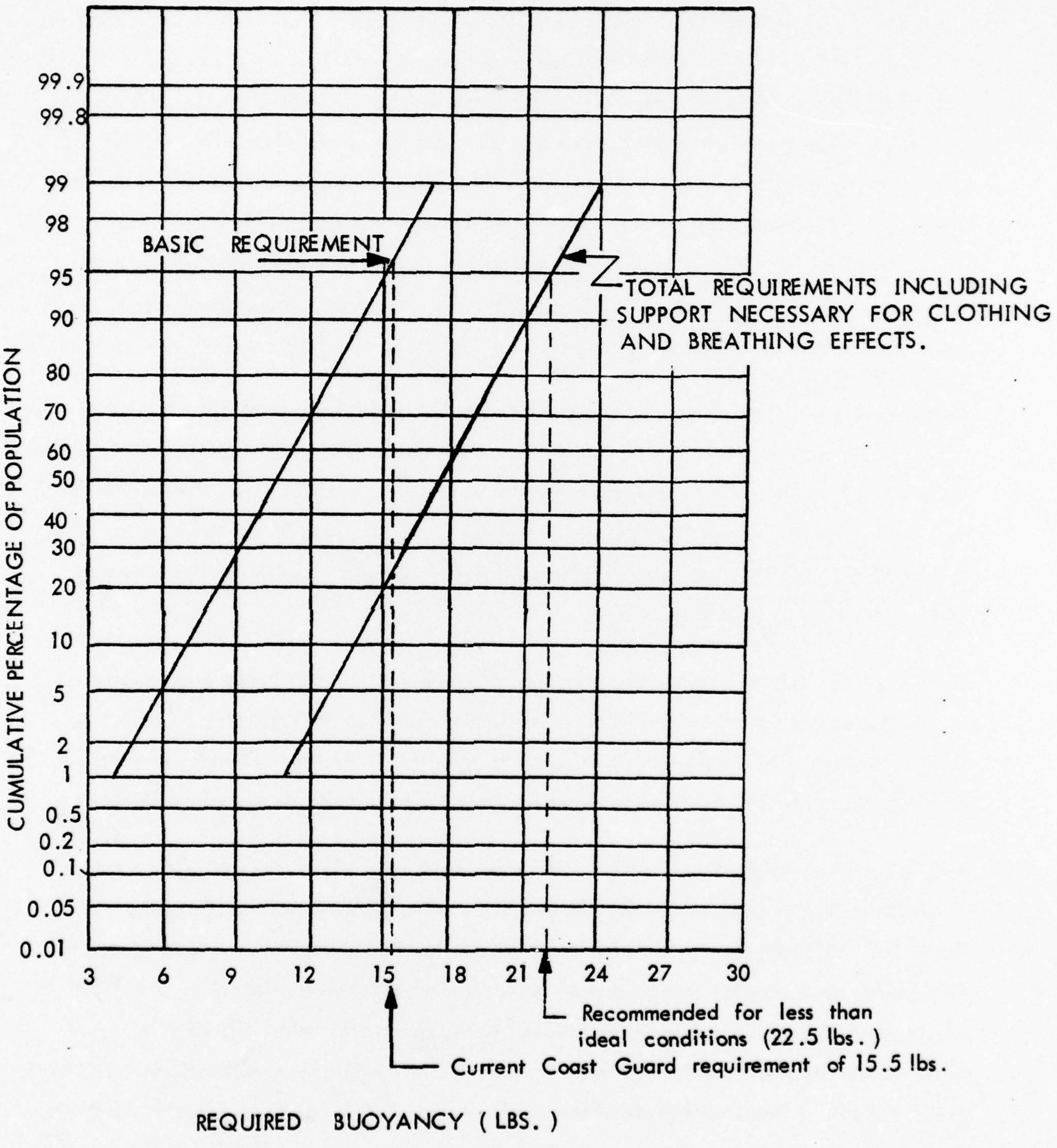
As can be seen from this figure, the current Coast Guard requirement of 15.5 lb (7.03 kg) of buoyancy supports 95% of the adult male population under non-clothed and ideal conditions. If, however, less than ideal conditions are encountered by an individual, the percentage of population covered by this 15.5 lb (7.03 kg) requirement drops to 25%. In order for a PFD to support 95% of the adult male population in less than ideal conditions, the buoyancy requirement rises to 22.5 lb (10.20 kg).

The problem of determining the required buoyancy for a reliable PFD will also be addressed during Phase II of the physical effectiveness portion of Wyle's PFD research. Using the results from this current research combined with the above mentioned previous research, a recommendation will be made by Wyle Laboratories as to a proper buoyancy requirement.

Besides setting a buoyancy requirement for PFDs, it is necessary to define the time that a PFD will be required to provide this buoyancy. Current Coast Guard requirements specify that a PFD shall still provide the required buoyancy after 24 hours submergence (24 hours for non-fibrous buoyant materials and 48 hours for fibrous buoyant materials). This time requirement needs to be reviewed and redefined in terms of the reliability definition. In order for the reliability definition to be valid, the time requirement must reflect the intended use of the PFD. The intended use of the various types of PFDs has been defined recently by Rear Admiral D.F. Lauth, Chief of the Office of Boating Safety. Admiral Lauth states that:

> "The Type II and III devices are recommended for use where there is a probability of quick rescue, such as areas where boating, fishing and other water activities are likely to occur." (Reference 3)

(TAKEN FROM BOOZ-ALLEN REPORT .... 1968)



BASIC REQUIREMENT

TOTAL REQUIREMENTS INCLUDING SUPPORT NECESSARY FOR CLOTHING AND BREATHING EFFECTS.

Recommended for less than ideal conditions (22.5 lbs.)

Current Coast Guard requirement of 15.5 lbs.

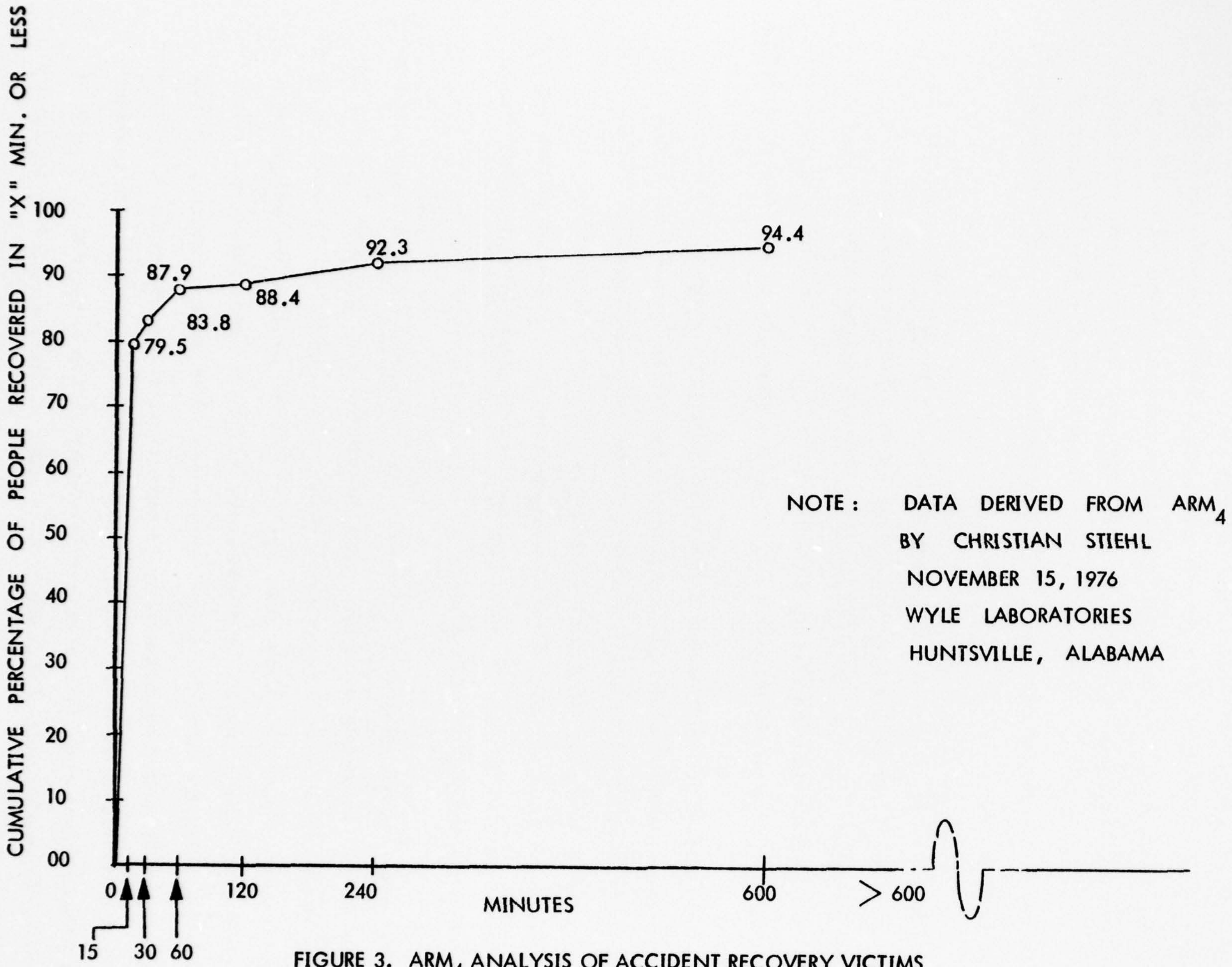
FIGURE 2. BUOYANCY REQUIREMENTS FOR PFD RELIABILITY

In order to quantify the phrase 'probability of quick rescue,' it was necessary to find out how long a person normally spends in the water due to an accident. This data was available from ARM_4 (Reference 4). Figure 3 gives an analysis of accident recovery victims in terms of the percentage of people recovered in "X" minutes or less. The graph shows that almost 95% of accident victims are recovered within 600 minutes (10 hours) or less. Therefore, it is recommended that the length of time a PFD must perform in the water (mission requirement) be limited to ten hours.

The last part of the reliability definition is that dealing with the useful life of the PFD. The useful life of the PFD shall be defined by the Coast Guard. Using the accelerated aging program developed, it will be possible to determine whether a manufacturer's PFDs are conforming to the Coast Guard's requirement for the useful life of the PFD. This requirment combined with manufacturer's quality control procedures would provide a meaningful criteria for evaluating PFDs.

A two step procedure is recommended to determine whether a PFD meets both quality control standards and a useful life criteria. This procedure is outlined in Figure 4 and 5. Test one would involve determining the quality of a randomly selected group of new PFDs from the manufacturer by testing for initial quality control (i.e., providing TBD pounds of buoyancy for ten hours) and determining a percentage passing. If the percentage passing this initial test is greater than some minimum percentage established by the Coast Guard, then the PFDs would pass the quality control phase.

Test two would involve testing PFDs to determine whether they pass the Coast Guard's requirement of minimum acceptable usable life. From the accelerated aging program (Reference 5), it will be possible to determine how much accelerated wear (y cycles) will correspond to normal usage (n years). Thus, if the Coast Guard specifys that a PFD should on the average last n years, the PFD manufacturer will be able to expose his PFDs to a corresponding y cycles in accelerated aging to simulate this natural aging process. After the aging process, the PFDs will be tested for mission requirements. If the percentage that pass this second test is less than some minimum requirement set by the Coast Guard, then this manufacturer's PFDs would fail the approval process also. In order for a manufacturer's PFDs to be acceptable, it would be recommended that his group of PFDs pass both the quality control and usable life requirements.



NOTE : DATA DERIVED FROM ARM_4
BY CHRISTIAN STIEHL
NOVEMBER 15, 1976
WYLE LABORATORIES
HUNTSVILLE, ALABAMA

FIGURE 3. ARM_4 ANALYSIS OF ACCIDENT RECOVERY VICTIMS

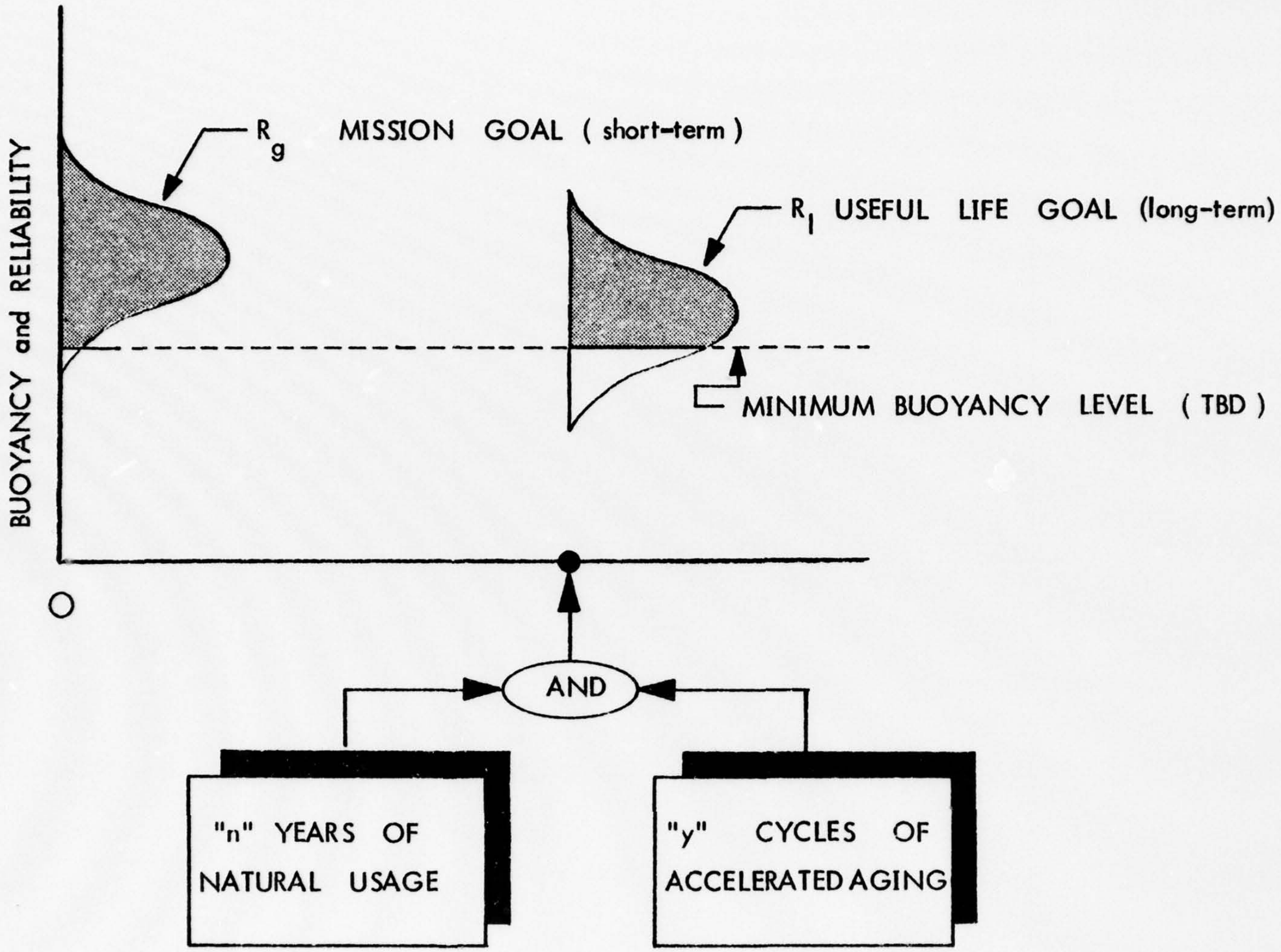

R_g MISSION GOAL (short-term)
R_l USEFUL LIFE GOAL (long-term)
MINIMUM BUOYANCY LEVEL (TBD)
BUOYANCY and RELIABILITY
O
AND
"n" YEARS OF NATURAL USAGE
"y" CYCLES OF ACCELERATED AGING

FIGURE 4. SHORT-TERM AND LONG-TERM RELIABILITY PERFORMANCE STANDARDS

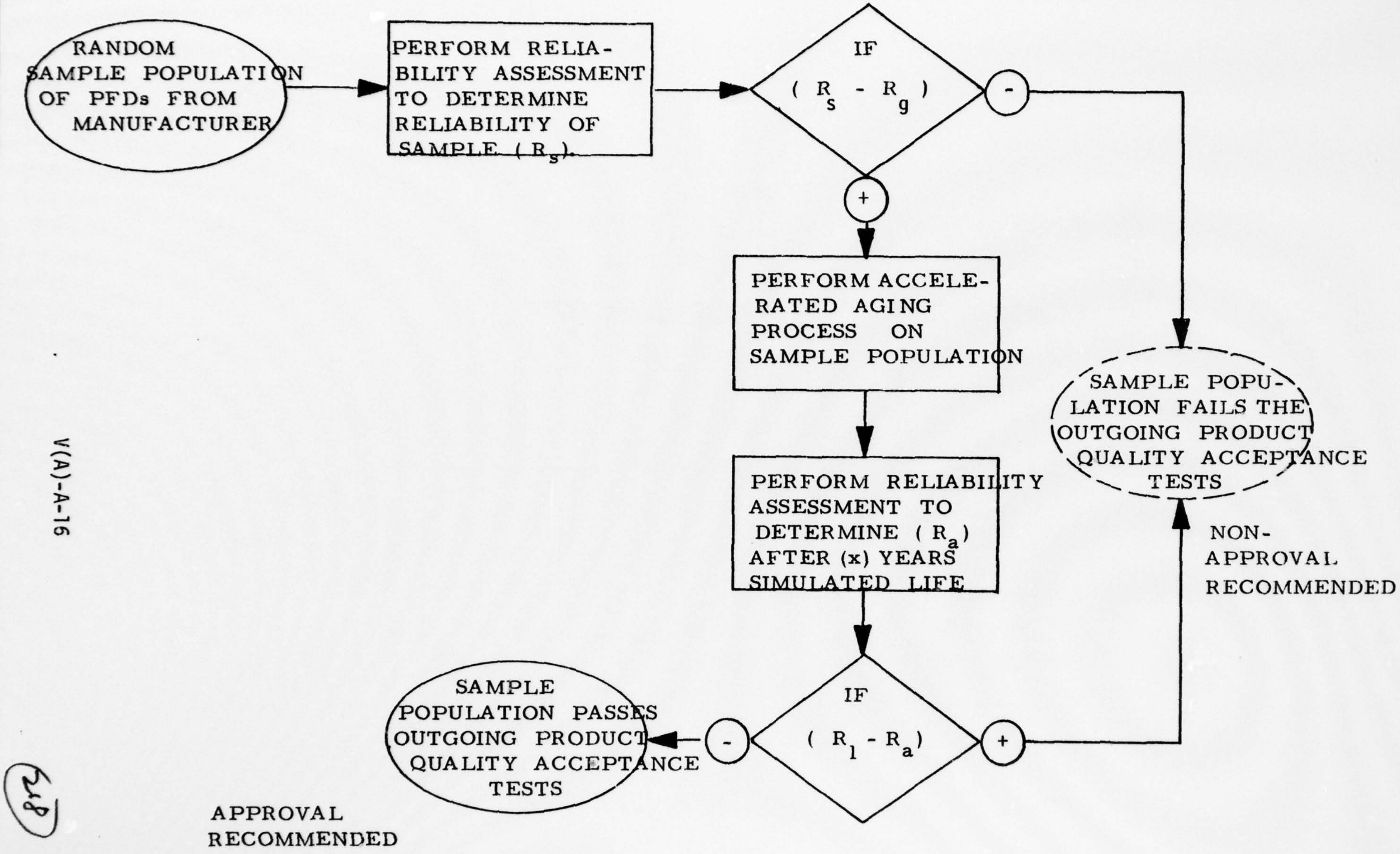

RANDOM SAMPLE POPULATION OF PFDs FROM MANUFACTURER
PERFORM RELIABILITY ASSESSMENT TO DETERMINE RELIABILITY OF SAMPLE (R_s).
IF (R_s - R_g)
-
+
PERFORM ACCELERATED AGING PROCESS ON SAMPLE POPULATION
PERFORM RELIABILITY ASSESSMENT TO DETERMINE (R_a) AFTER (x) YEARS SIMULATED LIFE
IF (R_l - R_a)
-
+
SAMPLE POPULATION FAILS THE OUTGOING PRODUCT QUALITY ACCEPTANCE TESTS
NON-APPROVAL RECOMMENDED
SAMPLE POPULATION PASSES OUTGOING PRODUCT QUALITY ACCEPTANCE TESTS
APPROVAL RECOMMENDED

FIGURE 5. PERFORMANCE STANDARDS APPROVAL PROCESS

4.0 REVIEW OF PAST WORK ON THE EFFECT OF STRESSORS ON BUOYANT MATERIALS AND PFDs

The following is a summary of the various buoyant materials used in PFDs and the effects of any stressors that have been observed or tested for.

Kapok

Kapok, a cellular material fiber with inherent buoyancy characteristics, is one of the oldest of the buoyant materials used in PFDs and thus the most extensively observed and tested of currently used buoyant mediums. The kapok used in PFDs now is enclosed in a flexible vinyl plastic covering to protect it from harmful stressors.

The oldest study found was performed by the U.S. Coast Guard (Reference 6) to determine the effects on buoyancy of exposure of kapok life jackets to various periods of simulated tropical and temperate stowage conditions. The results showed that life jackets with kapok enclosed in vinyl envelopes lost on the average 46% of their original buoyancy after only six months exposure to "simulated" tropical stowage conditions. Exposure to temperate stowage conditions showed losses of 5% of their original buoyancy. The reasons for this loss of buoyancy were attributed to both loss of volume of the vinyl envelopes and the wadding and packing of the kapok within the envelopes. No relationship was established between these simulated tropical stowage conditions and actual tropical stowage conditions.

A study was also performed by the Coast Guard (Reference 7) to determine the effects of exposure of new and used kapok filled life preservers (without plastic liners) to agitation in water, water and oil, and water and gas mixtures. The resultant losses in buoyancy of the life preservers due to exposure to these conditions were measured. The results showed that exposure of new and used kapok PFDs to water agitation for a twelve hour period resulted in losses of buoyancy averaging 19% of their original buoyancy. The used life jackets showed a buoyancy loss of 2-3 lb (0.91-1.36 kg) greater than the new jackets. Exposure of used kapok PFDs to mixtures of water and gas and water and oil resulted in much greater losses averaging almost 69% of their original buoyancy. Earlier results had indicated that new PFDs did not experience as great a loss as the used ones.

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These results suggest that: 1) New PFDs survived the exposure conditions better than the used ones. This result can probably be attributed to decrease in the effectiveness of the cover fabric repellant chemical. Since the histories of the used jackets were not documented, it was impossible to attribute the loss to any particular type of stowage or usage. 2) The exposure of kapok to oil and gas will accelerate the loss of buoyancy of the kapok.

An informal examination of kapok life jackets was made recently by a Canadian Committee on Life Jackets (Reference 8). The committee collected a group of life jackets whose age was in excess of ten years and examined them for possible failure modes. The committee pointed out several areas that could contribute to loss of buoyancy:

1. Severe deterioration of the covering fabric and splitting and cracking of the vinyl envelopes.
2. Possible mildew attack on the kapok.
3. Possibility of an interaction between the vinyl plastic and kapok contributing to deterioration of both.

The committee also pointed out, however, that "there was no evidence of any breakdown of the kapok fibers under these conditions."

A brief investigation was performed by Wyle researchers (Reference 9) to determine the effect on buoyancy of puncture of the vinyl envelope. A sample of Type IV PFDs that had been failed by local Coast Guard units were selected for analysis. The cushions were cut open and the vinyl envelopes of kapok removed. Buoyancy measurements were taken of the envelopes in a dry state and then the envelopes were slit and soaked in water for ten hours. The subsequent measurements revealed an average loss of buoyancy of 25% from the dry uncut stage. The usefulness of this result from a design and manufacturing standpoint are discussed.

Fibrous Glass

Fibrous glass is similar to kapok in that both are usually enclosed within vinyl plastic bags. Therefore, many of the problems mentioned before with kapok PFDs would possibly apply to fibrous glass PFDs. The one study (Reference 6) found suggests that the loss of buoyancy after exposure is not quite as severe as in kapok. The results of tests showed that exposure of the fibrous glass PFDs to "simulated" tropical stowage conditions for a period of up to one year resulted in losses of buoyancy of between 6-16% of their original buoyancy. More extensive testing is needed.

Foam Filled PFDs

Of the various foam products on the market, polyvinyl chloride (PVC) and polyethylene are the two showing the most extensive use for flotation purposes today.

Vinyl Foams

Vinyl foams vary extensively in their physical properties. Vinyl foams can be made into a soft, closed-cell form which has excellent properties as a buoyant medium. The most popular of these is polyvinyl chloride (PVC).

The three classifications of PVC foams are Types A, B, and C. Type A PVC foam can be used on all PFD types. Type B PVC foam is restricted for use on Type II and III PFDs. Type C PVC foam is intended for use only on Type IV PFDs. The major difference between these foams is in their fire retardant ability. The major manufacturers of these foams are listed in Appendix A.

The earliest known study done on PVC (the exact type was not specified) was the Coast Guard's study on the effects of tropical stowage of life jackets (Reference 6). After one year's exposure under "simulated" tropical stowage conditions, the average percentage loss in buoyancy was almost 9%. After one year's exposure under temperate stowage conditions, the average percentage loss in buoyancy was almost 6%. It appears that most of the loss in buoyancy for both conditions occurred during the first six months.

In 1965, sample lots of B.F. Goodrich's Type A, B, and C foams were tested for compliance with Subpart 164.015 dated September 8, 1965, of 46 CRF, Specification for Plastic Foam, Unicellular Buoyant, Sheet and Molded Shapes (References 10 and 11). The results showed that the Type B foam failed the test for volume loss on heat aging.

Though this test was never directly related to loss of buoyancy, this indicates that further testing is warranted to determine the relationship that actually exists between heat exposure and loss of buoyancy.

In addition to the literature search performed, major manufacturers of flotation materials were contacted to find out the effects of environmental stressors on their product and the type of testing used (see Appendix A for a complete list of manufacturers contacted). All manufacturers of PVC foams reported limited testing of their foams for effects of environmental stressors.

Polyethylene

Polyethylene is the other flotation foam that has received wide acceptance as a buoyant material for personnel flotation devices. Of the various polyethylene foams available, the low-density foam was found to have acceptable physical properties for use in PFDs. The major types of polyethylene foams found in use are: Dow's Ethafoam, Voltek's Volara A and E and Minicell, and Gilman's Surlyn.

In 1962, the Coast Guard sponsored a study of the effects of two usage environments on the buoyancy of Dow's Ethafoam (Reference 12). The study consisted of taking initial buoyancy measurements on twelve PFDs, storing two under a controlled air-conditioned situation, and distributing five each for a year's use by Coast Guard units in New York and Miami. The results showed the average loss of buoyancy for PFDs in New York at 4.1% of the original buoyancy; in Miami at 3.9% of the original buoyancy. The loss of buoyancy for PFDs stored in the control environment was 2.5% of the original buoyancy. No relationship was demonstrated between service and exposure and loss of buoyancy.

The only other testing found on the effects of environmental stressors on polyethylene was a weatherometer test of Voltek's Volara flotation material (Reference 13). This test was performed by University of Lowell, Lowell, Massachusetts, using an Atlas Weatherometer. Various types of Voltek's flotation material and a PVC foam were exposed to combinations of light and spray for varying periods of time. Tests were made for characteristics such as tensile strength, elongation and tear resistance. The polyethylene showed much less wear (cracking) than the PVC foam. No tests were performed for loss of buoyancy. Also, no correlation was demonstrated or implied between this accelerated aging method and natural aging.

These results can best be used to point up problem areas in flotation materials. However, more systematic and statistically significant results must be gathered in order to develop effective and valid reliability test methods.

5.0 REVIEW OF CURRENT TEST METHODS

The purpose of this section is to review the methods currently used in testing PFDs for reliability and to review any accelerated aging methodology that would be useful.

Contact was made with Canadian and Australian governments and two German testing organizations to assess the state of their PFD reliability program (Appendix A). The Australian testing program provided tests for resistance to corrosion, crushing, heat, petroleum products and flame. While several of these tests were related to percentage loss of buoyancy, no justification could be found for the use of these tests as they relate to the recreational boating environment. The heat test of $60^{\circ} \pm 2^{\circ}$C for 168 hours is similar to that recommended by ASTM standards.

Canadian standards use tests for breaking strength and elongation, tear resistance and buoyancy after heat aging. The buoyancy after heat aging test is similar to the Australian and ASTM standards in that both an initial buoyancy and then a percentage loss of buoyancy after exposure to $60^{\circ} \pm 3^{\circ}$C for 168 hours is determined. No justification in terms of representative conditions found in recreational boating could be found for these tests either.

In addition to the Canadian and Australian governments contacted, two German testing groups were contacted (see Appendix A). Responses were received from these organizations, but a review of their recommended references showed nothing that would be of interest.

Several manufacturers of buoyant foams reported that ASTM testing methods are used in testing their products. These were reviewed for relevant material:

> ASTM D-1667-70 - This specification lists several general tests that are recommended for closed-cell polyvinyl chloride foams. General methods for determining compression deflection, compression set under constant deflection, volume change on heat aging, low temperature test, water absorption and density are outlined.
>
> ASTM D-1056-73 - This specification covers some tests for flexible cellular materials - sponge or expanded rubber. Tests included are general physical test requirement, aging test, compression set, fluid immersion and low temperature test.

ASTM G-23 through G-27 - These are recommended practices that cover basic principles and standard operating procedures for light and water exposure apparatus.

These tests may provide a useful index of the general characteristics and quality of the tested material; however, they are of little use in developing test methods to predict the reliability of PFDs under recreational boating conditions. These tests are only useful when used in conjunction with test results from natural aging, otherwise they correlate to nothing and thus mean nothing. ASTM recognizes this and says, "...While useful for other purposes, results obtained by the use of this recommended practice should not be represented as equivalent to those of any natural weathering test or tests until the degree of such correlation, if any, has been established for each material."

Another source of information on general and accelerated testing were Military Test Procedure (MTP) 6-2-532-Sunshine Test and MIL-STD-810-Environmental Test Methods. These methods are again quite general and thus preclude detailed coverage of any specific item. These methods make no attempt to correlate to any natural aging.

In 1946 (Reference 14), the Coast Guard developed an apparatus for accelerating wear of life jackets. The device, called the Lucas Life Jacket Testing Machine, drags life jacket clad dummies through an obstacle course to simulate wear conditions that jackets might meet in actual conditions. However, the problem was again found to be "...no correlation has been demonstrated between the accelerated wear given in the Lucas Machine to actual shipboard wear."

As was mentioned before, a more recent study (Reference 13) was sponsored by Voltek to test flotation materials in an accelerated weathering apparatus called the Atlas Weatherometer. The accelerated weathering consisted of various cycles of light and spray. After exposure to this weathering for different durations, the flotation material was tested for elongation, tensile and tear resistance. The problems with this test were: 1) no attempt was made to measure loss of buoyancy with aging, and 2) no attempt was made to correlate the accelerometer aging with natural aging.

Underwriter's Laboratories has recently published U.L. 1191 — Specifications for Buoyant Materials. This standard recommends that testing for the effect on buoyancy of heat aging, compression, and oil immersion be performed. The standard also recommends tests for tensile strength and flexibility. The problem with U.L. 1191 is similar to those discussed previously. Apparently, no attempt was made to determine whether the tests are representative of natural conditions.

6.0 CONCLUSIONS

The review of testing done on flotation materials and PFDs revealed that most tests were of an observational and qualitative nature. That testing which did produce quantitative results was not organized and performed in a manner which led to statistically reliable or representative findings. Therefore, previous testing on flotation materials and PFDs can only be taken as an indication of problem areas.

The results of the studies on the use of kapok as a flotation material have indicated that failures (loss of buoyancy) may occur as a result of either loss of the water-tight vinyl envelope or loss of the inherent buoyancy of the kapok. Loss of the water-tight vinyl envelope could be caused by puncture, repeated compression, drying and cracking of the envelope or a combination of these factors. Loss of the inherent buoyancy of the kapok could be caused by breakdown of kapok fibers, mildew, wadding of the kapok, and possible interaction of vinyl and kapok. Current evidence suggests that the breakdown of the vinyl envelope is a greater problem than the loss of the inherent buoyancy of the kapok. If this is the case, design strategies can be applied to solve the problem (Reference 9). Research is needed to pinpoint the problem.

Fibrous glass presents a problem similar to kapok PFDs in that the fibrous glass is also enclosed within a vinyl envelope. Very little is known on factors affecting the inherent buoyancy of fibrous glass. The methodology employed to improve the design of kapok PFDs could also be used on fibrous glass PFDs.

The results of the review of studies on polyvinyl chloride (PVC) foams suggest that heat and light could have a degrading effect on the foam material. Testing is needed to determine the effects of these stressors on buoyancy.

Preliminary testing on the use of polyethylene foam PFDs under one year's actual use showed that the PFDs demonstrated very little loss in buoyancy. Further testing is also needed here.

Due to the lack of information on stressors that contribute to the failure of PFDs, it is necessary to design experiments that will point out the environmental stressors and any interactions of stressors that degrade PFDs. The information from these experiments is necessary in order to make sound engineering judgments as to the type and level of stressors to be used in developing the accelerated aging program.

The results of the literature search on PFD testing revealed two main problems with previous testing:

1. The type of tests used on PFDs failed to test for conditions representative of what a PFD would normally be exposed to.
2. The accelerated tests failed to reflect the total spectrum of environmental and usage stressors that a PFD might be exposed to nor did they attempt to relate accelerated stressors to normal stressors (aging).

In order for a program on reliability to produce meaningful and useful results, these two problems must be remedied. Failure to remedy the above problems would produce meaningless and useless results because the question of how the PFD stands up to "real-world" environmental and usage stressors will not have been answered. The use of tests that do not address these problems will only increase the cost of the PFD through unnecessary testing and design requirements. The application of the principles outlined in this report could result in testing requirements for PFDs which are less stringent and less complicated than current test procedures.

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APPENDIX A. LIST OF MANUFACTURERS AND TESTING GROUPS CONTACTED

Organization	Product	Comments
Airex, A.G.	PVC Foam Type S30.5	No Response to Letter
Dow Chemical Company	Polyethylene Foam - Ethafoam	Letter and Telephone Contact
Gentex Corporation	Type A Foam	Telephone Contact
Gilman Corporation	Polyethylene Sheet - Surlyn	Telephone Contact
Housatonic Everfloat Company	Type A and C PVC Foam	Telephone Contact
Inmont Corporation	PVC Foam	Telephone Contact
Marine Flotation Products, Incorporated	Type A, B, and C PVC Foam	Telephone Contact
Rubatex Corporation	Type A Foam	Telephone Contact
Voltek, Incorporated	Polyethylene - Volara A, Volara E, Minicell	Telephone Contact
Uniroyal, Incorporated	Type A PVC Foam - Ensolite	Telephone and Letter Contact
Bernhard-Nocht-Institute (West Germany)	Testing	Letter Response
Isitut Fur Warenprufung Und Qualitutsuberwachung (West Germany)	Testing	Letter Response

APPENDIX V(A)-B

WYLE LABORATORIES
MARINE TECHNOLOGY STAFF
TECHNICAL BRIEF 77-01

PLANS, PROCEDURES, AND TECHNIQUES FOR ACCELERATED AGING AND RELIABILITY ASSESSMENT OF INHERENTLY BUOYANT PFDs

by

Ronald E. Giuntini

January 1977

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PREFACE

The purpose of this Technical Brief is to provide G-DSA with an outline of Wyle's approach and methodology for assessing the reliability of new and/or existing PFDs and for predicting their reliability due to aging.

An extensive literature search was performed by Mr. Michael Pfauth and will be presented in a forthcoming companion Technical Brief. Through Mr. Pfauth's analysis of the purpose and intent of the aging plan, outlined herein, the Environmental Profile Data Sheet was derived to provide a vehicle for gathering and recording relevant environmental and usage data. This is a key item in the sample population screening.

PLANS, PROCEDURES, AND TECHNIQUES FOR ACCELERATED AGING AND RELIABILITY ASSESSMENT OF INHERENTLY BUOYANT PFDs

1.0 INTRODUCTION

The problem of determining the reliability of PFDs is a complex one because of the following complications:

1. Many different types of flotation materials are used for a given PFD type.
2. There are many manufacturers employing different manufacturing techniques with varying degrees of quality control.
3. Buoyancy requirements (i.e. 15.5 lb) to which a PFD type is designed and manufactured presently represent a compromise (trade-off) between buoyancy and wearability. These buoyancy requirements are, therefore, inconsistent in their relationship to a given percentage of the population, thus forcing a very flexible definition of what constitutes a reliable PFD.
4. Previous and current testing of PFDs has had no significant relationship to real world usage and environmental effects and subsequently little to do with product outgoing quality acceptance tests and their relationship with the product reliability.

Before getting into the purpose of this Technical Brief, which is to present a rationale and a methodology for accelerated aging of inherently buoyant PFDs, a few background ideas and definitions are in order.

Definition of PFD Reliability

In general, reliability of a device is the probability that it will operate successfully for a specified period of time and under specified conditions when used in the manner and for the purpose intended.

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A more specific definition of reliability as applied to PFDs was derived. Reliability of a PFD is the probability that the PFD will provide sufficient buoyanct to support 95% of the male population fully clothed (__* pounds of buoyancy) for a period of 10 hours** and be able to provide such support for a minimum of ___*** years.

The buoyancy required to support 95% of the fully clothed male population is approximately 22.5 pounds while that required to support 99% is 24 pounds (Reference 1). While this data has been cited in Reference 1, it was taken from a 1946 study performed by Mellon Institute of Industrial Research (Fellowship Number 316B-1) and will be verified in the physical effectiveness portion of the PFD study.

There are three implications that can be derived from the above definition as follows:

- A failure occurs when the PFD does not have the capability of supporting 95% of the fully clothed male population or, in other words, providing (TBD) pounds of buoyancy for 10 hours.
- Maltreatment of a PFD beyond the designed purpose and intent could result in the PFD's inability to perform its function. Occurrences of such treatment should not constitute failures as these random-type events are independent of quality of manufacturing, materials, design specifications, environmental factors, and normal usage and degradation.
- Sufficient buoyancy must be provided initially to accommodate buoyancy loss due to degradation with age so that the minimum buoyancy remains for (TBD) years of useful life.

With most hardware items, components, and systems, the definition of a failure is less subjective and is often recognized by a discrete event such as inadvertent termination of operation. Also, it is often a binary situation where the device either functions or does not function. However, in other cases, total cessation of operation is not essential for the item to be

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* To be determined.

** The 10 hours was derived by Mr. C. Stiehl and Dr. T. Doll of Wyle Laboratories from ARM_4 data.

*** To be determined.

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defined as having failed but rather a sufficient amount of degradation in its performance can signify a failure. PFDs resemble the latter case in that a minimum effective buoyancy (TBD) is required for a minimum number of years (TBD). The definition of reliability for PFDs has been carefully constructed so that is encompasses both the mission reliability (short term) of providing _*_ pounds of buoyancy for 10 hours and the required life (long term) in years for which the PFD will have to be able to provide that mission reliability.

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* To be determined.

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2.0 STRESSOR MODELING

The environmental stressor modeling, designated as Phase I* for work breakdown purposes, involves eight major steps. Figure 1 is a flowchart showing the sequence of the major activities. Each of the eight steps will be discussed in the following sections.

Step 1 — Selection Criteria

The intent of this step is to narrow down the scope of the analysis to a manageable size by a screening process. Figure 2 shows that within the conventional categories by type, there are many similarities based on the flotation materials used. A particular flotation material may be found in all four types of PFDs. Another important factor in the selection process involves possible differences in a PFD's performance due to manufacturing techniques. It is felt that this variance can be minimized by testing only a particular brand within a given type/style/flotation material grouping at a time. If one manufacturer's products are more prone to failure than another, it will become apparent.

Step 2 — Stressors Identification

The most apparent and obvious stressors that potentially have an effect on the degradation of PFDs and subsequently their reliability are the following:

a. Solar radiation (primarily ultraviolet light)
b. Temperature (high and low geographic regional excursions)
c. Humidity
d. Salt spray
e. Water/moisture (wetting and drying cycles)
f. Other factors (possibly mildew)

Step 3 — Environmental Profile Data Sheet

This is a very crucial step in the stressor modeling process. The development of this item requires a thorough analysis of a large number of possible situations and tentative answers

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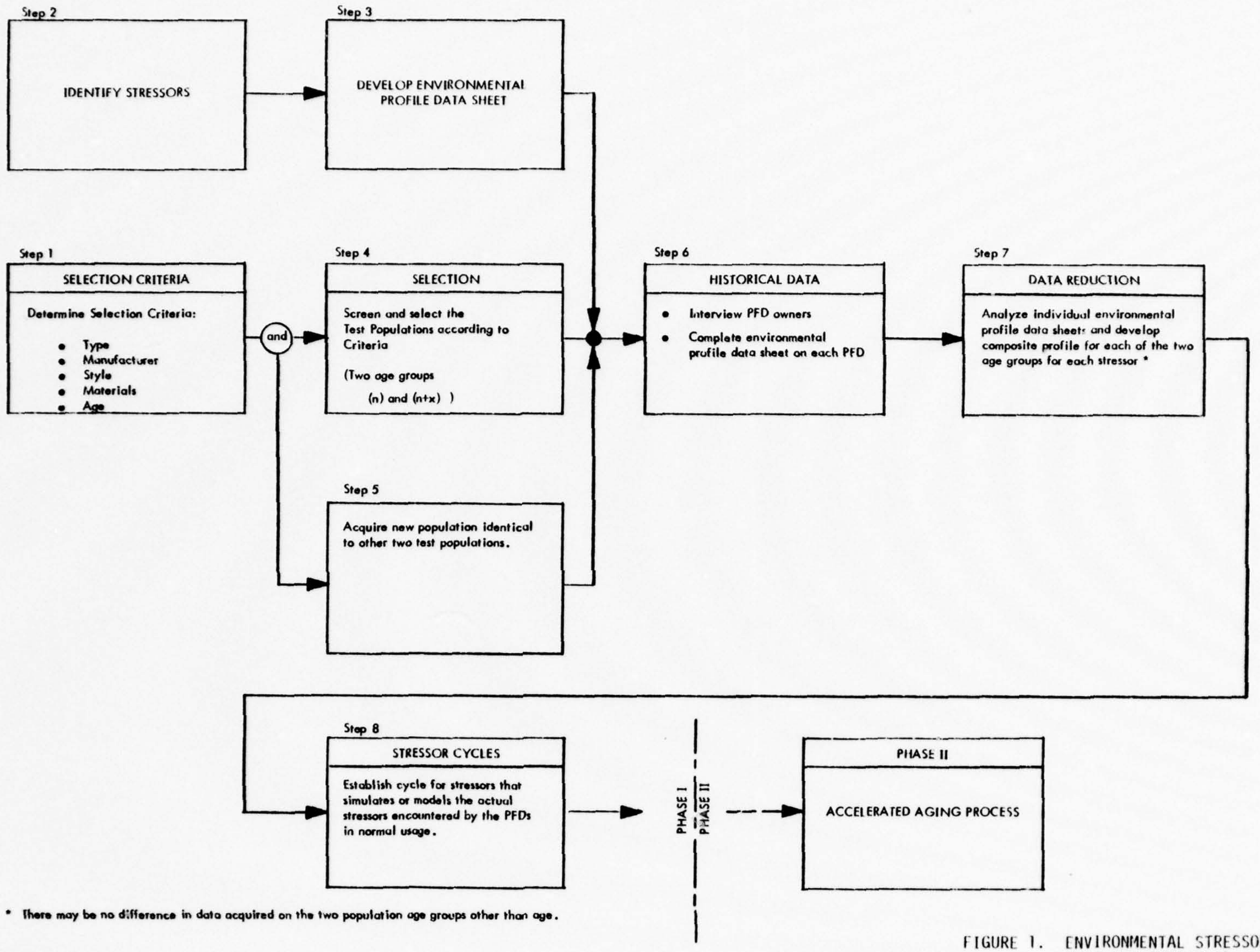
*Phase I (and also Phase II) as used in this Technical Brief have reference to the scope of the activities defined and discussed herein and should not be mistaken for the Phase I PFD study which was completed in July 1976.


Step 2
IDENTIFY STRESSORS
Step 3
DEVELOP ENVIRONMENTAL PROFILE DATA SHEET
Step 1
SELECTION CRITERIA
Determine Selection Criteria:
• Type
• Manufacturer
• Style
• Materials
• Age
and
Step 4
SELECTION
Screen and select the Test Populations according to Criteria
(Two age groups (n) and (n+x))
Step 5
Acquire new population identical to other two test populations.
Step 6
HISTORICAL DATA
• Interview PFD owners
• Complete environmental profile data sheet on each PFD
Step 7
DATA REDUCTION
Analyze individual environmental profile data sheets and develop composite profile for each of the two age groups for each stressor *
Step 8
STRESSOR CYCLES
Establish cycle for stressors that simulates or models the actual stressors encountered by the PFDs in normal usage.
PHASE I
PHASE II
PHASE II
ACCELERATED AGING PROCESS

* There may be no difference in data acquired on the two population age groups other than age.

FIGURE 1. ENVIRONMENTAL STRESSOR MODELING (PHASE I)

245
246+
245
246X

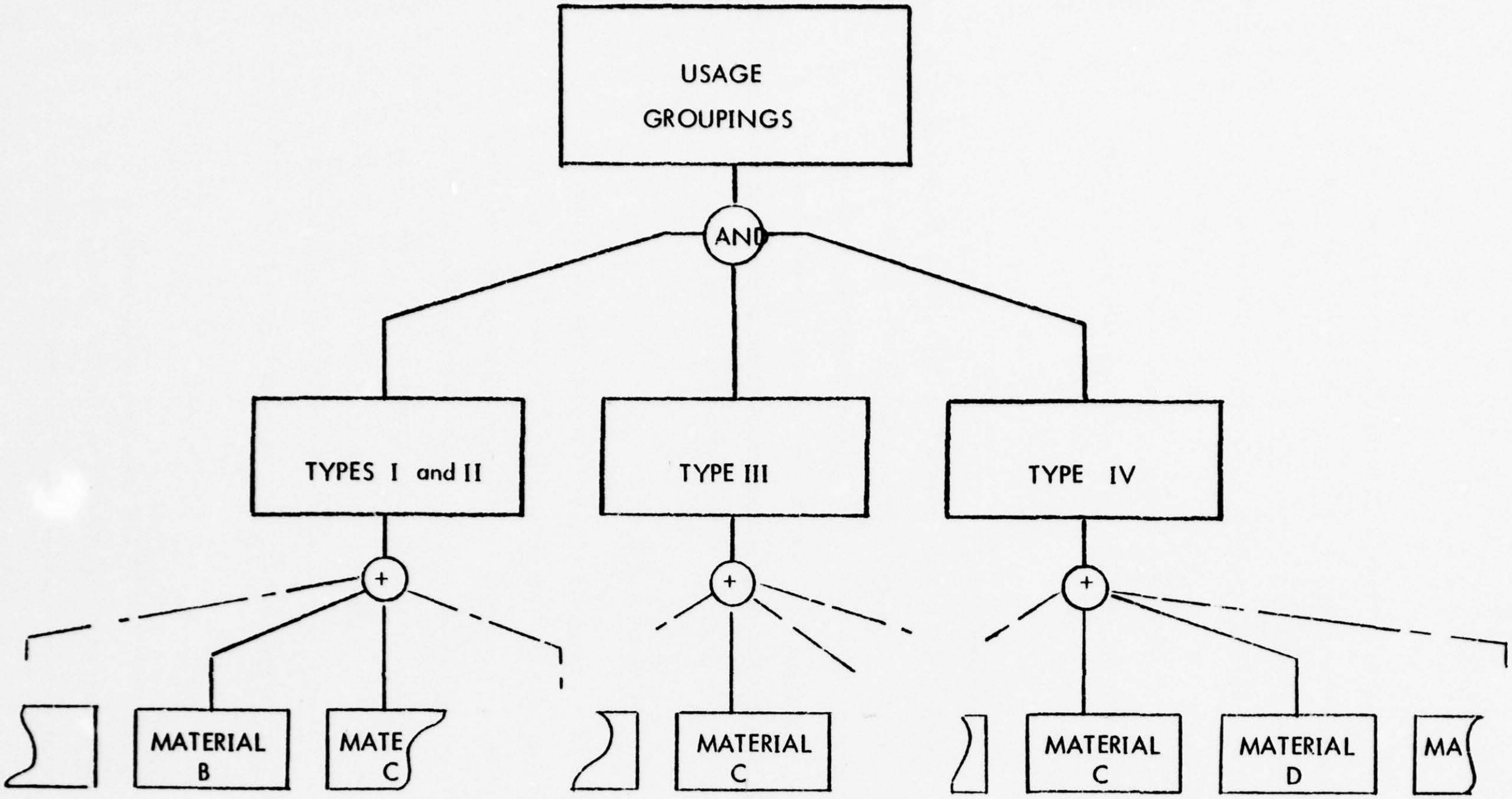

USAGE GROUPINGS
AND
TYPES I and II
TYPE III
TYPE IV
+
+
+
MATERIAL B
MATE C
MATERIAL C
MATERIAL C
MATERIAL D
MA

FIGURE 2. POSSIBLE TESTING CATEGORIZATION BASED UPON TYPE OF FLOTATION MATERIAL

or solutions in the event of their occurrences. It represents the basic scheme for gathering essential data on individual environmental stressor history for a particular PFD and data consolidation for the sample population. Since the primary purpose of the data sheet is to provide a vehicle for assuring that the essential details for environmental stressors are not neglected, it must have sufficient depth to enable a realistic simulation of the environment to be obtained. Many of the data cells on the data sheet are mutually exclusive thereby reducing or, in some cases, eliminating certain data cells. The Environmental Profile Data Sheet is exhibited in Figure 3.

Step 4 — Selection

In this step of the environmental stressor modeling flow, a segment of the overall PFD population is screened and selected. The individual units of this sample population of a specific type, style, manufacturer, and flotation material must be the same age and experience somewhat the same environmental factors and usage factors. Such a sample population will provide a data point on a reliability versus time plot. At least two such sample age groups will be required for the analysis. One group of age (n) and the second of age (n+x).

Step 5 — New Population

For purposes of the reliability analysis, it is apparent that this population must be identical to the two sample populations of ages (n) and (n+x) years. That is, it must be of the same type, manufacturer, style, and flotation material. This sample population will enable the reliability to be determined for a new population. A degradation-with-age function, thus, can be constructed from the three age group samples (0-years, n-years, and (n+x)-years). Such a function would resemble the one illustrated in Figure 4. This step (Step 5, Phase I) does not require the buoyancy measurement nor a reliability assessment of the three sample populations. These are required in Step 6 of Phase II, the accelerated aging process, and both will be discussed there.

Step 6 — Historical Data

This is a key step in environmental stressor modeling process. As stated in Step 3, the data sheet provides a measure of assurance that the engineer/analyst will not neglect specific

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					USAGE STRESSORS							STORAGE STRESSORS			SUNLIGHT EXPOSURE		WATER EXPOSURE						TEMPERATURE EXPOSURE			HUMIDITY EXPOSURE		
									NON-USE								ENVIRONMENTAL EXPOSURE											
MONTHS	ESTIMATED DAYS OF USAGE OF PFD PER MONTH	AVERAGE LENGTH OF OUTING	AVERAGE HRS/MONTH	TOTAL HRS/MONTH	WEAR (Does it get wet usually?)	WATERSKIING	SWIMMING	SITTING ON	DIRECT EXPOSURE	INDIRECT EXPOSURE	NON-EXPOSURE	DIRECT EXPOSURE	INDIRECT EXPOSURE	NON-EXPOSURE	MONTHLY HRS OF SOLAR RADIATION (Storage and Usage)	TOTAL HRS OF SOLAR RADIATION	DAYS OF RAIN	ESTIMATED NO. OF DAYS EXPOSURE	NO. OF DAYS PFD GETS WET	ESTIMATED NO. OF OTHER WETTINGS	AVG. NO. OF MONTHLY WETTING/DRYING CYCLES	TOTAL NO. OF WETTING/DRYING CYCLES	AVG. MONTHLY TEMPERATURE	AVERAGE NO. OF HRS EXPOSURE	TOTAL NO. OF HRS EXPOSURE	AVERAGE RELATIVE HUMIDITY	AVERAGE NO. OF HRS EXPOSURE	TOTAL NO. OF HRS EXPOSURE
DECEMBER																												
JANUARY																												
FEBRUARY																												
MARCH																												
APRIL																												
MAY																												
JUNE																												
JULY																												
AUGUST																												
SEPTEMBER																												
OCTOBER																												
NOVEMBER																												
TOTALS																												

NOTES: ______________________________

ENGINEER/ANALYST: ____________
DATE: ____________
LOCATION/AREA: ____________

WYLE LABORATORIES

ENVIRONMENTAL PROFILE DATA SHEET

FIGURE 3. ENVIRONMENTAL PROFILE DATA SHEET

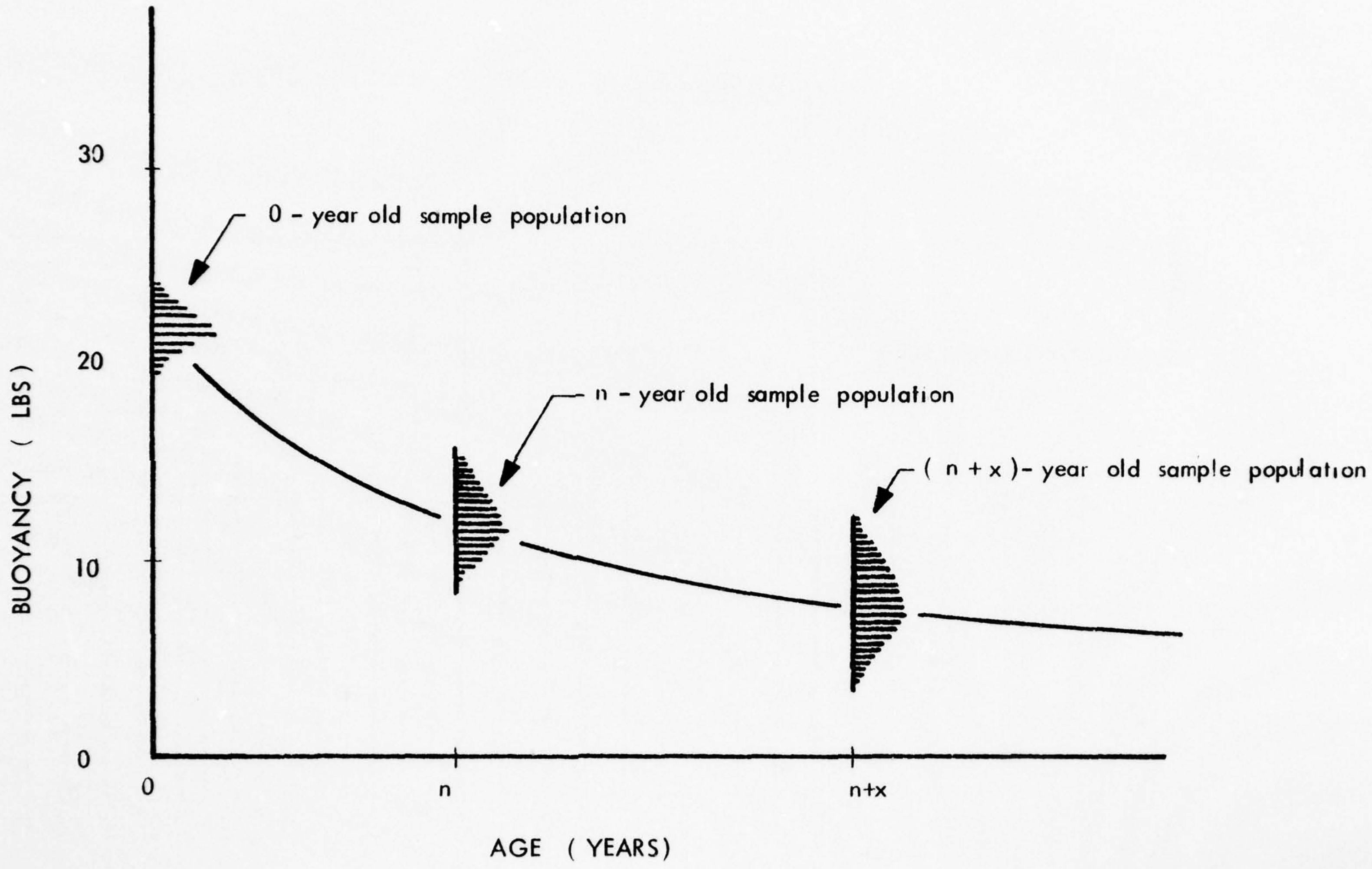

FIGURE 4. BUOYANCY AS A FUNCTION OF AGE

crucial stressors and factors that are essential to the environmental stressor modeling during the interviews. Once a PFD has been screened by the engineer as to its type, style, manufacturer, and flotation material, the age must be determined. If the age is either (n), or (n+x) (e.g. n = 4, (n+x) = 9), some predetermined age groupings, the interview will be continued. The engineer must be able to acquire reasonable estimates of various environmental and usage exposures from the interviewee. Other data will be extracted from the Local Climatological Data (LCD) prepared by the Environmental Data Service, National Oceanic and Atmospheric Administration. The LCD will provide the monthly hours of solar radiation, days of rain, average monthly temperature, and average relative humidity. Abusive usage or other abnormal exposure of a PFD to certain stressors would be grounds for exclusion from the sample population as being atypical and not representative. The actual mechanics employed in interviewing, in gathering and recording relevant information on a single PFD can become a time consuming and burdensome task.

Step 7 — Data Reduction

In this step a composite environmental profile for the sample population will be derived from the individual environmental profile data. It should represent the environmental and usage stressors to which a typical PFD of n-year sample population experienced in a specific geographical region. This is depicted in Figure 5, Stressor Modeling Process. The diagram shows that a composite environmental profile data sheet, which represents the mean environmental profile for the sample population, will be further reduced to individual stressor models for solar radiation, temperature, etc.

Step 8 — Stressor Cycles

Finally, a schedule will be constructed from the individual stressor models that show discrete stressor cycling that will simulate the actual field exposure. The purpose of such a schedule is to enable the usage of various pieces of test equipment. In such a schedule, no attempt is made to accelerate the stressors, that is to shorten the time exposure to a stressor by increasing the level of the stressor above that which would normally occur in usage.

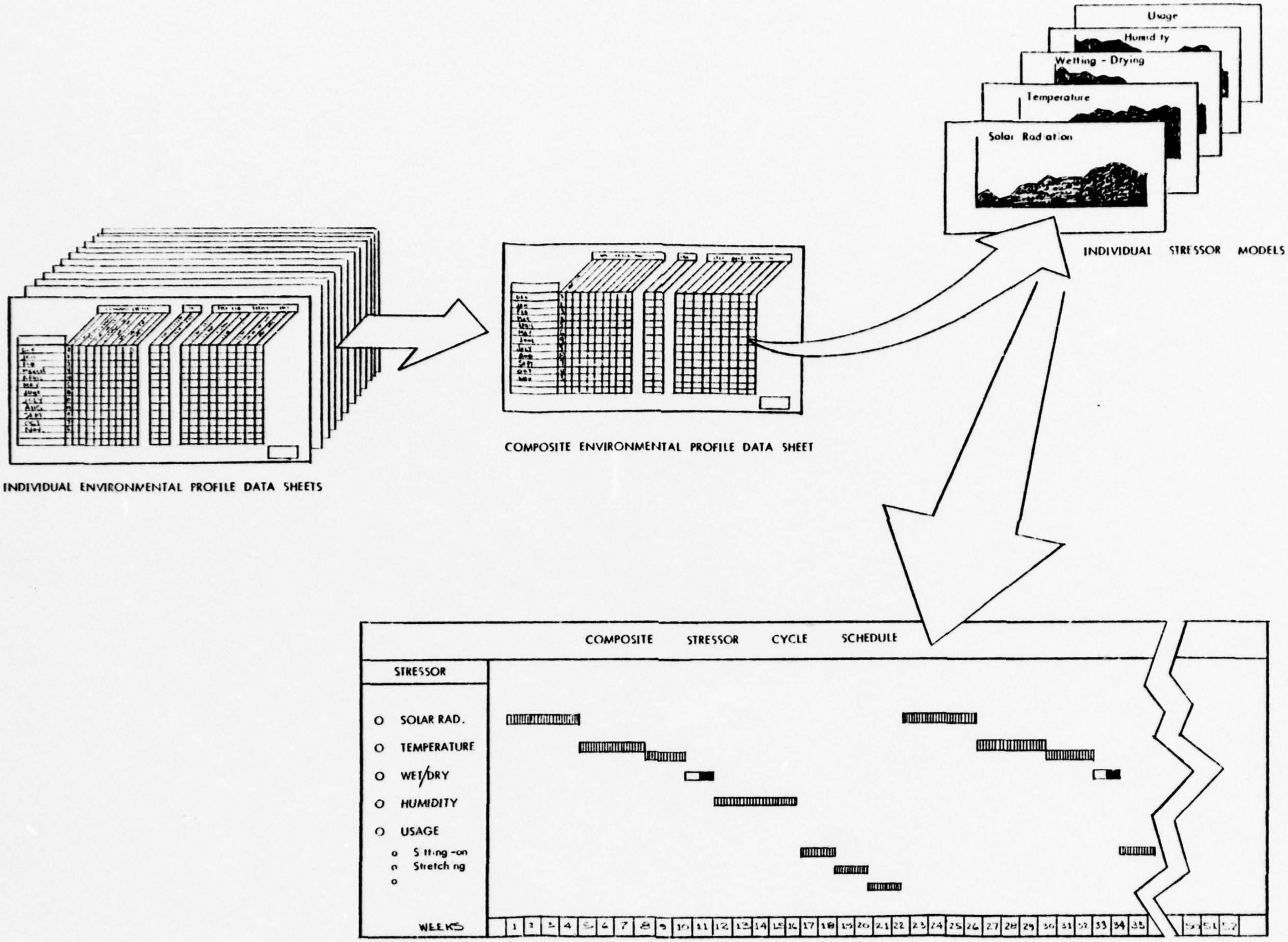
Usage
Humid ty
Wetting - Drying
Temperature
Solar Rad at on
INDIVIDUAL STRESSOR MODELS
INDIVIDUAL ENVIRONMENTAL PROFILE DATA SHEETS
COMPOSITE ENVIRONMENTAL PROFILE DATA SHEET
COMPOSITE STRESSOR CYCLE SCHEDULE
STRESSOR
O SOLAR RAD.
O TEMPERATURE
O WET/DRY
O HUMIDITY
O USAGE
o S tting -on
o Stretch ng
o
WEEKS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
50 51 52

FIGURE 5. STRESSOR MODELING PROCESS

3.0 ACCELERATED AGING

The accelerated aging process is designated as Phase II and is presented in Figure 6. It is a flowchart of sequential events and activities required to accelerate the aging and assess the reliability of sample populations. Although ten steps are shown, the actual process may involve repetition of some steps. It is an iterative procedure with feedback and control looping until the desired results are obtained. Each of the ten steps will be briefly discussed.

Step 1 — Overstress Experiments

Thus far all concepts discussed that pertain to environmental modeling have been only concerned with nominal stress levels. Such simulated stressing attempts to match the expected stressors on a one-for-one basis (e.g. the level of stressors is not increased). This type of modeling, however, requires an extraordinary amount of time and, therefore, is not feasible within the short turnaround time of this project. Therefore, in order to shorten the aging (test) time to something within the realm of feasibility, overstressing (accelerating the stressors) must be performed. Accelerated testing is extrapolatory in nature in that inferences are made from actual happenings in a time compressed situation and compared to supposed happenings if the stressors were normalized and a longer test time used. Overstressing must be confined to some limiting envelope. For example, in buoyancy versus temperature, there is a limit on the independent variable of temperature beyond which the predictability of the independent variable of buoyancy is meaningless. This step of the flow will establish some basic parametric experiments that will be conducted on small sample of PFDs of particular flotation materials. The objective of the experiments will be to determine which parameters (stressors) are significant to buoyance degradation and the range of overstress (stress level limits) for reasonable predictability. A simplified example of buoyance behavior under increasing levels of stress is exhibited in Figure 7. This figure shows the anticipated degradation of buoyance with stress and assumes a given test duration time. It is, also, expected that as the test duration increases, holding the stressor(s) at a constant level, the buoyancy will decrease. This concept is shown in Figures 8 and 9. The former depicts a response surface for buoyancy as a function of the test duration time and temperature. The latter shows a response surface for buoyancy as a function solar radiation level and test duration. The purpose of these experiments is to determine buoyance behavior characteristics

259 256x 255 256x

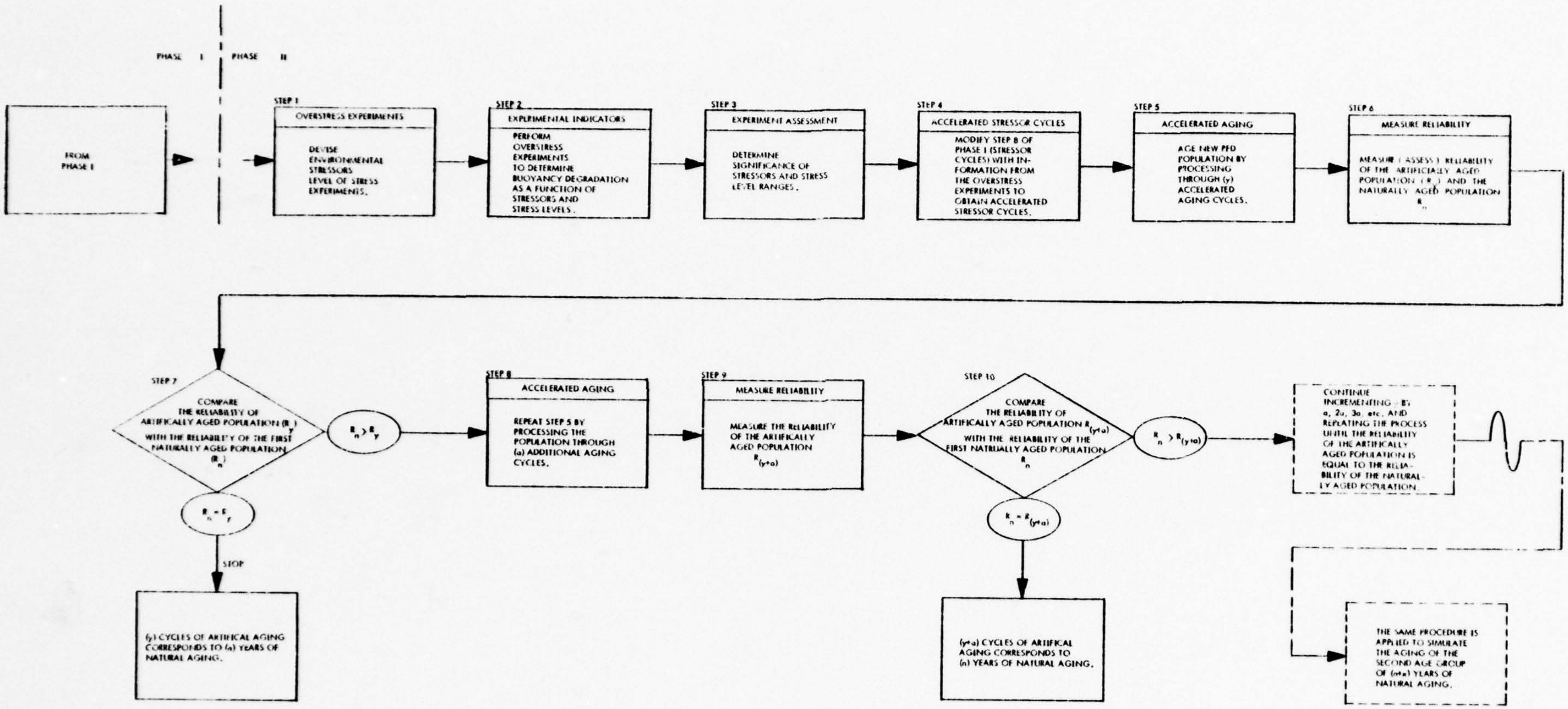
PHASE I
PHASE II
FROM PHASE I
STEP 1
OVERSTRESS EXPERIMENTS
DEVISE ENVIRONMENTAL STRESSORS LEVEL OF STRESS EXPERIMENTS.
STEP 2
EXPERIMENTAL INDICATORS
PERFORM OVERSTRESS EXPERIMENTS TO DETERMINE BUOYANCY DEGRADATION AS A FUNCTION OF STRESSORS AND STRESS LEVELS.
STEP 3
EXPERIMENT ASSESSMENT
DETERMINE SIGNIFICANCE OF STRESSORS AND STRESS LEVEL RANGES.
STEP 4
ACCELERATED STRESSOR CYCLES
MODIFY STEP 8 OF PHASE I (STRESSOR CYCLES) WITH INFORMATION FROM THE OVERSTRESS EXPERIMENTS TO OBTAIN ACCELERATED STRESSOR CYCLES.
STEP 5
ACCELERATED AGING
AGE NEW PFD POPULATION BY PROCESSING THROUGH (y) ACCELERATED AGING CYCLES.
STEP 6
MEASURE RELIABILITY
MEASURE (ASSESS) RELIABILITY OF THE ARTIFICIALLY AGED POPULATION (R_y) AND THE NATURALLY AGED POPULATION R_n
STEP 7
COMPARE THE RELIABILITY OF ARTIFICALLY AGED POPULATION (R_y) WITH THE RELIABILITY OF THE FIRST NATURALLY AGED POPULATION (R_n)
$R_n > R_y$
$R_n = R_y$
STOP
(y) CYCLES OF ARTIFICAL AGING CORRESPONDS TO (a) YEARS OF NATURAL AGING.
STEP 8
ACCELERATED AGING
REPEAT STEP 5 BY PROCESSING THE POPULATION THROUGH (a) ADDITIONAL AGING CYCLES.
STEP 9
MEASURE RELIABILITY
MEASURE THE RELIABILITY OF THE ARTIFICALLY AGED POPULATION $R_{(y+a)}$
STEP 10
COMPARE THE RELIABILITY OF ARTIFICALLY AGED POPULATION $R_{(y+a)}$ WITH THE RELIABILITY OF THE FIRST NATRUALLY AGED POPULATION R_n
$R_n > R_{(y+a)}$
$R_n = R_{(y+a)}$
(y+a) CYCLES OF ARTIFICAL AGING CORRESPONDS TO (n) YEARS OF NATURAL AGING.
CONTINUE INCREMENTING - BY a, 2a, 3a, etc. AND REPEATING THE PROCESS UNTIL THE RELIABILITY OF THE ARTIFICALLY AGED POPULATION IS EQUAL TO THE RELIABILITY OF THE NATURALLY AGED POPULATION.
THE SAME PROCEDURE IS APPLIED TO SIMULATE THE AGING OF THE SECOND AGE GROUP OF (n+x) YEARS OF NATURAL AGING.

FIGURE 6. ACCELERATED AGING PROCESS (PHASE II)

257
258x
257
258 X

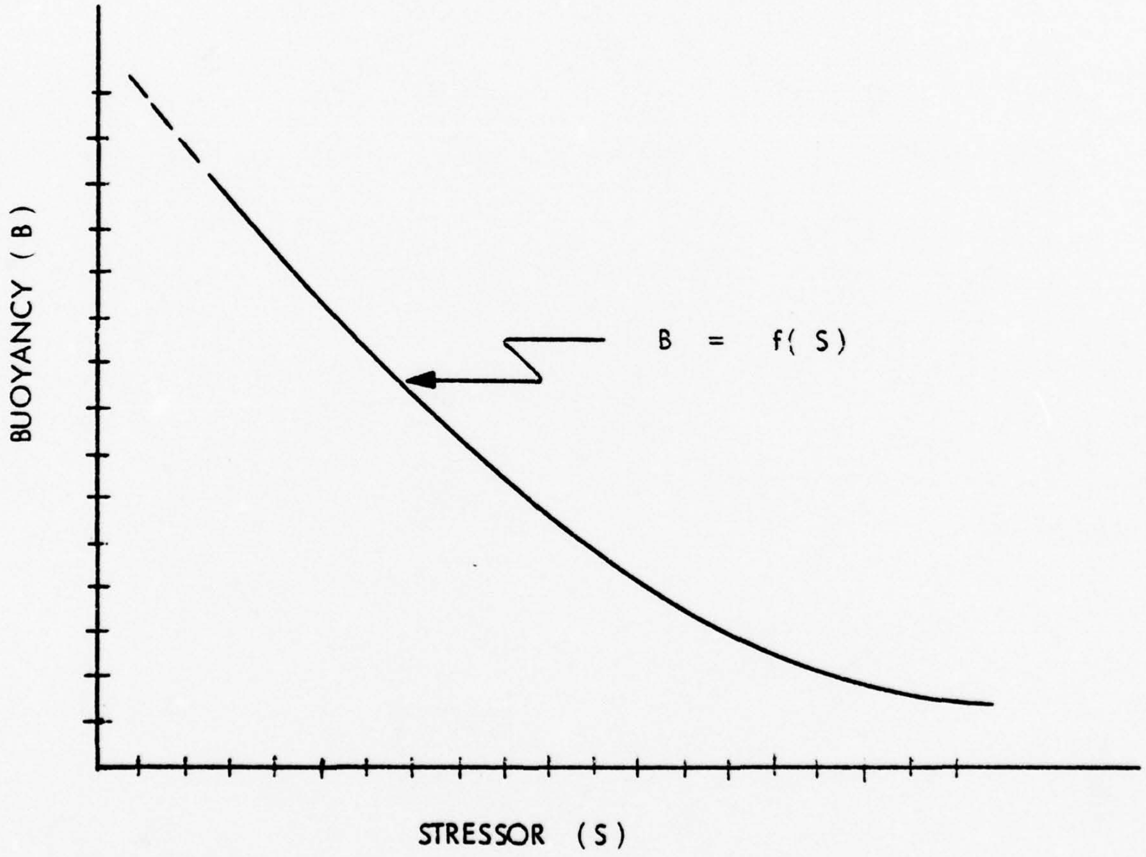

FIGURE 7. DEGRADATION OF BUOYANCY AS A FUNCTION OF INCREASING LEVEL OF STRESS

259

259

PFD ACCELERATED AGING
PROGRAM

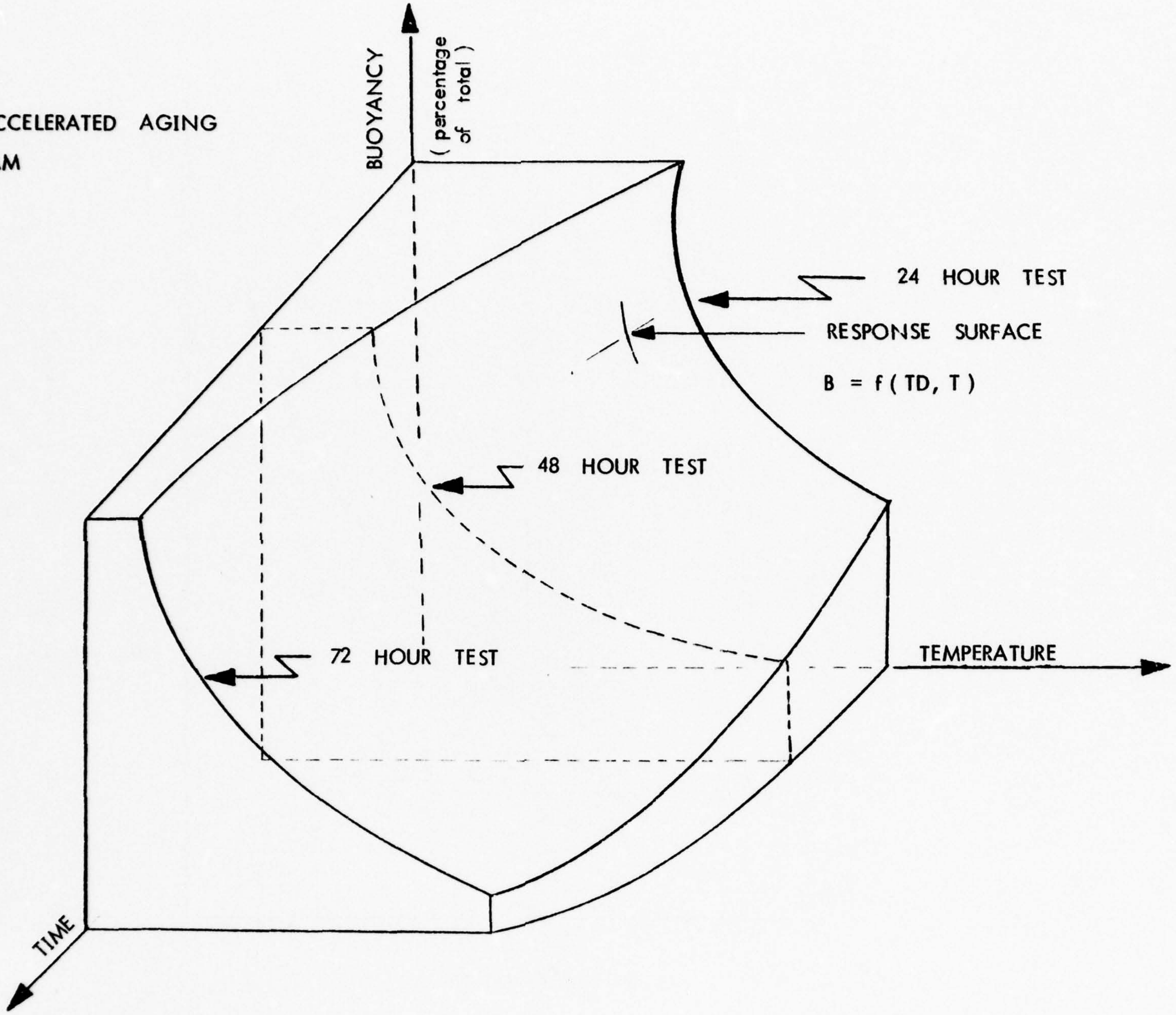
BUOYANCY
(percentage
of total)
24 HOUR TEST
RESPONSE SURFACE
B = f (TD, T)
48 HOUR TEST
72 HOUR TEST
TEMPERATURE
TIME

FIGURE 8. BUOYANCY AS A FUNCTION OF TEMPERATURE AND TEST DURATION

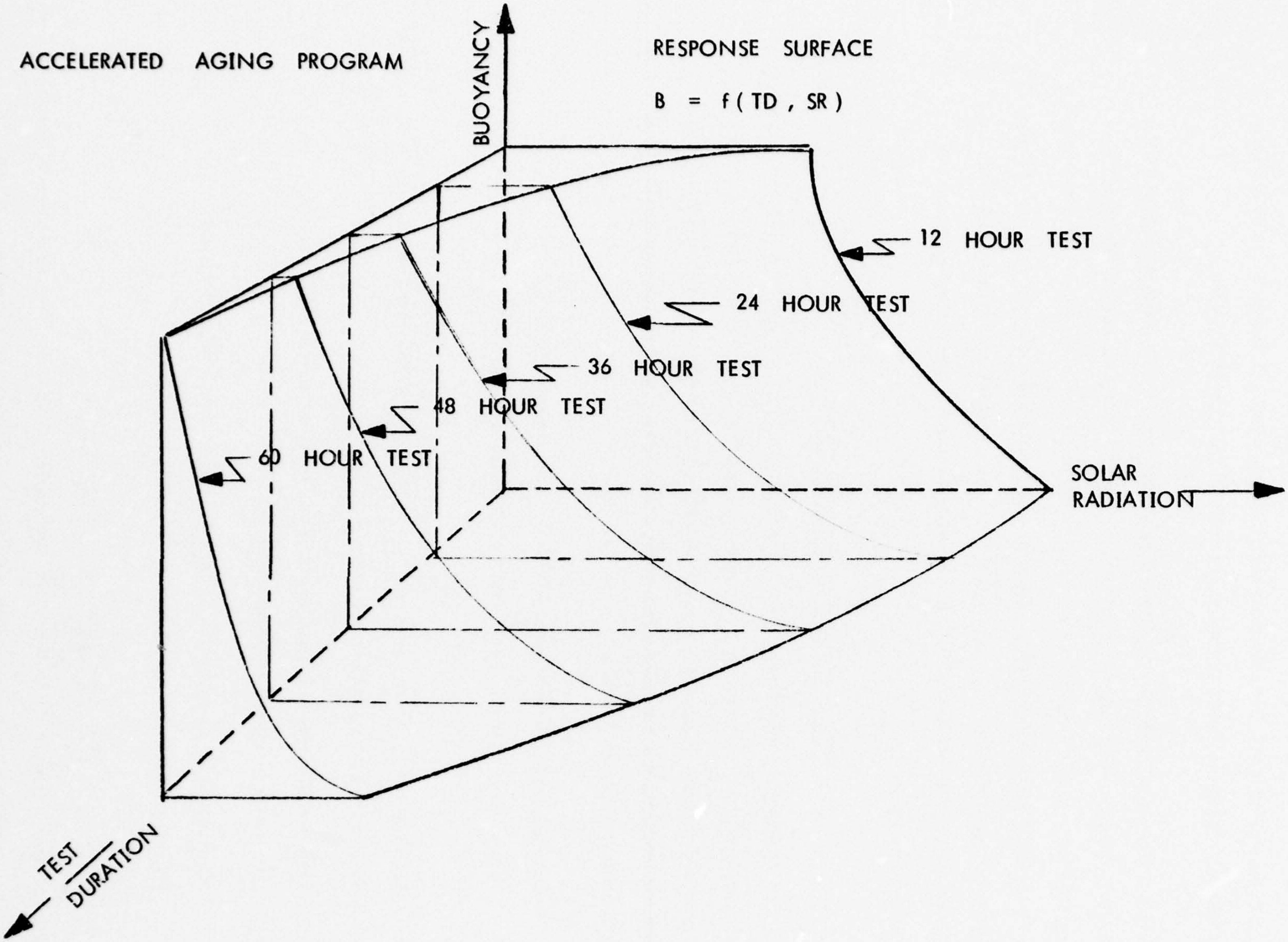
ACCELERATED AGING PROGRAM
BUOYANCY
RESPONSE SURFACE
B = f (TD , SR)
12 HOUR TEST
24 HOUR TEST
36 HOUR TEST
48 HOUR TEST
60 HOUR TEST
SOLAR RADIATION
TEST DURATION

FIGURE 9. BUOYANCY AS A FUNCTION OF SOLAR RADIATION LEVEL AND TEST DURATION

under various stress conditions. The response surfaces are shown in slices taken at various test duration times. Behavior trend data can be derived from selected slices.

It is desirable to combine as many environmental stressors in the accelerated testing as the "real conditions" dictate. The stressor profiles will help in devising applicable combinations. It may be that induced buoyancy degradation due to two independent stressors taken sequentially is entirely different from the effect of their simultaneous application. Figure 10 shows a response surface of buoyancy as a function of temperature and solar radiation. In this example the interaction effects of the two stressors can be noted. Test duration time was held constant in Figure 10.

Step 2 — Experimental Indicators

The previous step explained the rationale and general logic involved in the overstress experiments as discussed and the measurement of buoyancy degradation of the experiment sample due to the various stressors. Figure 11, Buoyancy Test and Procedural Flow, illustrates the fundamental breakdown of the procedure and logic involved. The first four operations are part of Step 2 and these are as follows:

1. Submerge experiment sample PFDs for a 10-hour time period. This follows from the basic definition of reliability as explained in the introduction.
2. Measure the buoyancy of each new (not stressed) PFD and record, B_{N_i}, (i = 1 through n of the sample size).
3. Perform overstress experiments on PFDs in accordance with Step 1, previously discussed in detail.
4. Measure buoyancy of each overstressed specimen PFD and record, B_{O_i}.

Step 3 — Experiment Assessment

The first decision box of Figure 11 initiates the beginning of Step 3. The objective of the comparison test is to determine the importance of various stressors to the aging process. If

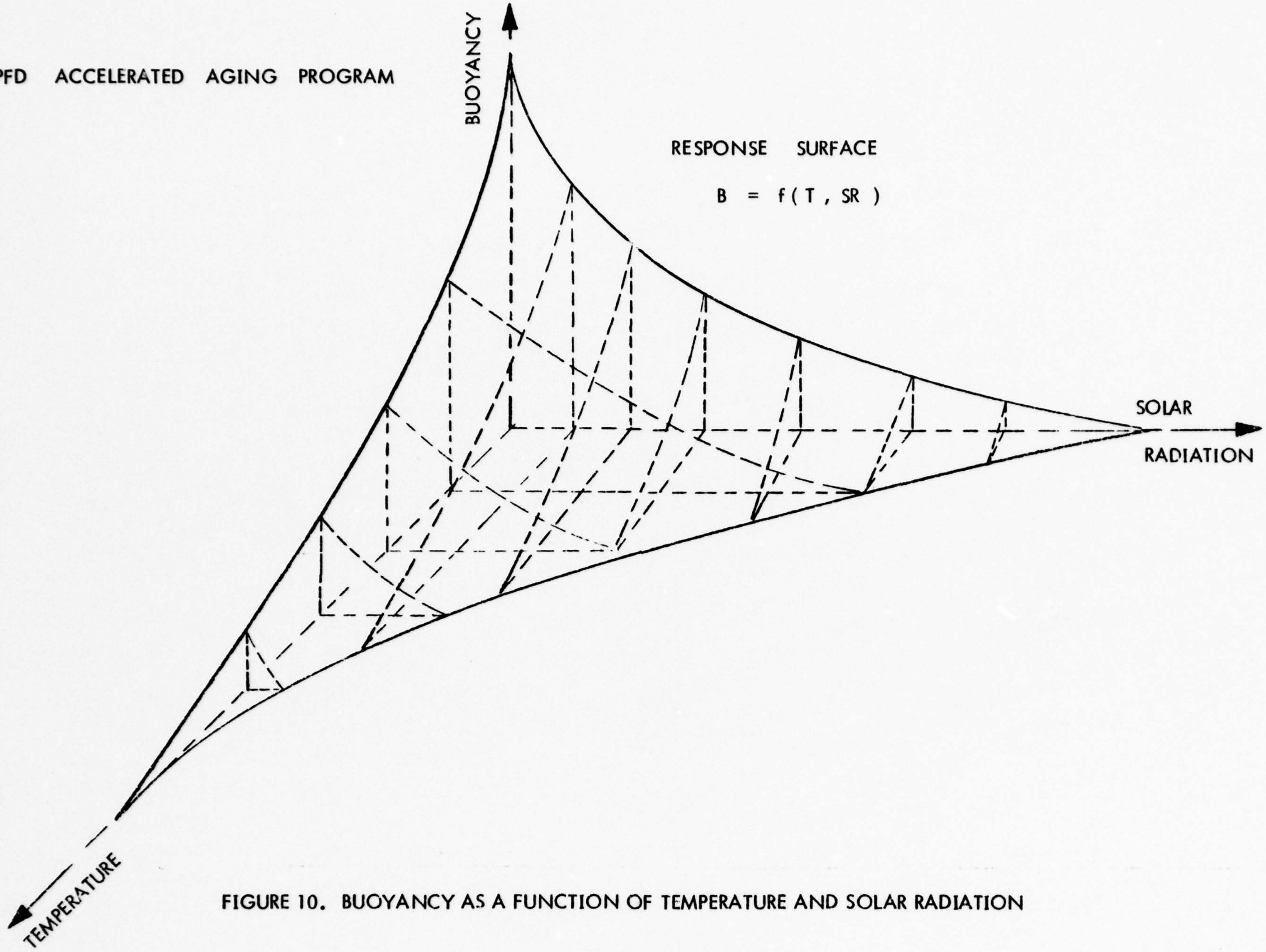
BUOYANCY
RESPONSE SURFACE
B = f(T, SR)
SOLAR RADIATION
TEMPERATURE

FIGURE 10. BUOYANCY AS A FUNCTION OF TEMPERATURE AND SOLAR RADIATION

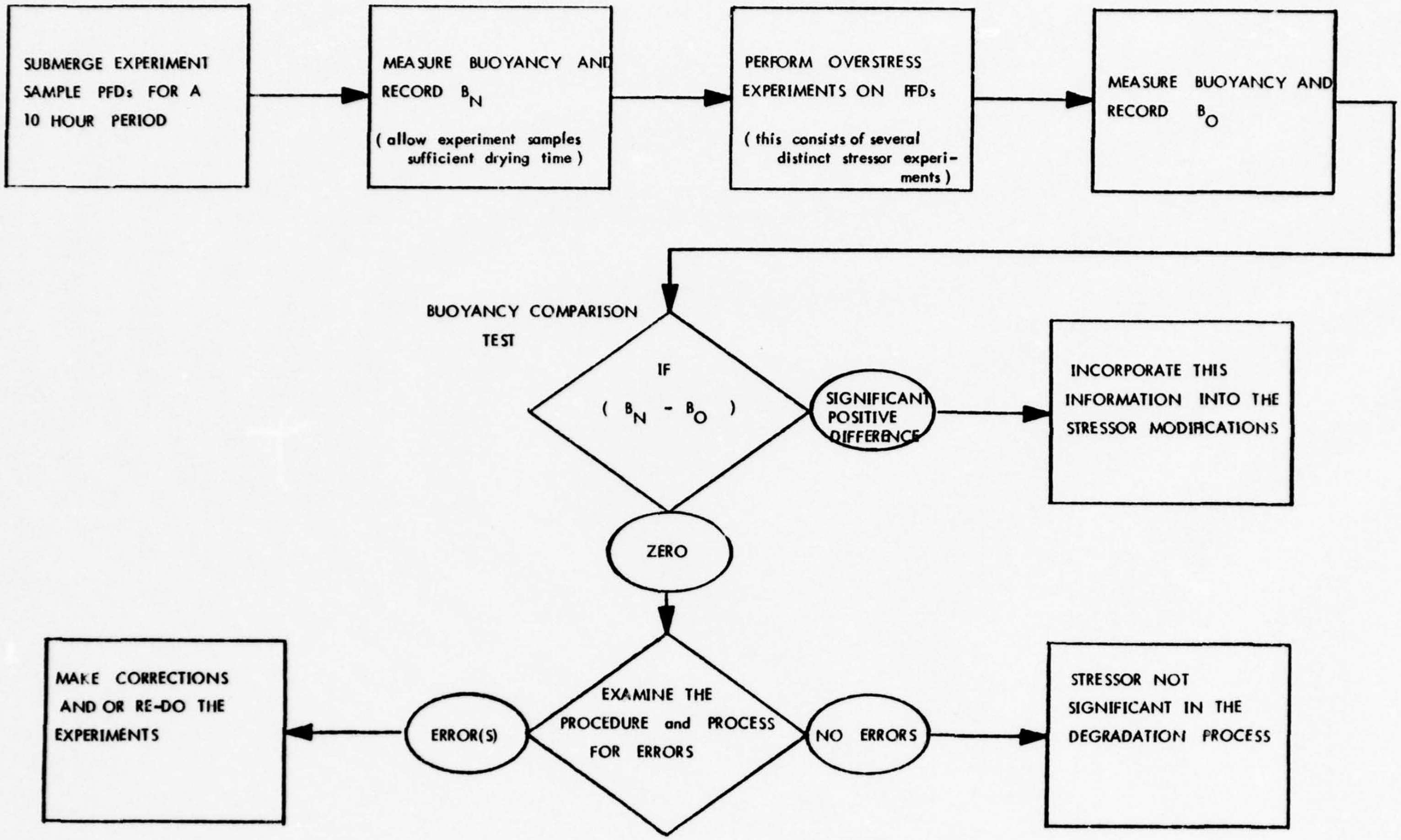
SUBMERGE EXPERIMENT SAMPLE PFDs FOR A 10 HOUR PERIOD
MEASURE BUOYANCY AND RECORD B_N
(allow experiment samples sufficient drying time)
PERFORM OVERSTRESS EXPERIMENTS ON PFDs
(this consists of several distinct stressor experiments)
MEASURE BUOYANCY AND RECORD B_O
BUOYANCY COMPARISON TEST
IF (B_N - B_O)
SIGNIFICANT POSITIVE DIFFERENCE
INCORPORATE THIS INFORMATION INTO THE STRESSOR MODIFICATIONS
ZERO
EXAMINE THE PROCEDURE and PROCESS FOR ERRORS
ERROR(S)
MAKE CORRECTIONS AND OR RE-DO THE EXPERIMENTS
NO ERRORS
STRESSOR NOT SIGNIFICANT IN THE DEGRADATION PROCESS

FIGURE 11. BUOYANCY TEST AND PROCEDURAL FLOW

it is indicated that a particular stressor has no significance, the test process will be examined to assure no errors were introduced that could account for this occurrence.

Step 4 — Accelerated Stressor Cycles

The information derived from the overstress experiments will be fed back to Step 8 of Phase I of this plan. If necessary, the stressor cycles will be modified to reflect the learnings from the experiments. Some stressors may be dropped altogether as having no significant effects, while the level range of effectivity of other stressors may be altered.

Step 5 — Accelerated Aging

This step is the beginning of the accelerated aging (overstressing) on the sample population. Previous overstressing experiments were a prelude to this step and should not be confused with it. In this operation the new PFD sample population is processed through some (y) number of artificial or simulated aging cycles such as presented in Step 8, Phase I. The number (y) is an arbitrary number but,with engineering judgment that will be accrued at the time of the test, should be a fairly close approximation of the actual aging process under normal environmental and usage conditions.

Step 6 — Measurement of Reliability (Assessment)

The sample population that was aged (y) cycles in Step 5 now will be tested to determine its reliability, R_y. The reliability assessment is relative to some lower boundary limit of buoyance (TBD in the physical effectiveness portion of the PFD study). Figure 12 indicates the reliability assessment for the new population, R_o, and after artifically aging through (y) and (y+a) aging cycles. The numbers shown are for illustration purposes only. In addition to assessment of the reliability of the artificially aged population, the reliability of the naturally aged population must, also, be assessed.

Step 7 — Natural Aging/Artificial Aging Comparison

The purpose of the comparison is to determine when to cease the aging cycle. This is essentially a trial-and-error process using feedback and control logic. The process is illustrated in Figure 13. A sample population, naturally aged for (n) years represents the target

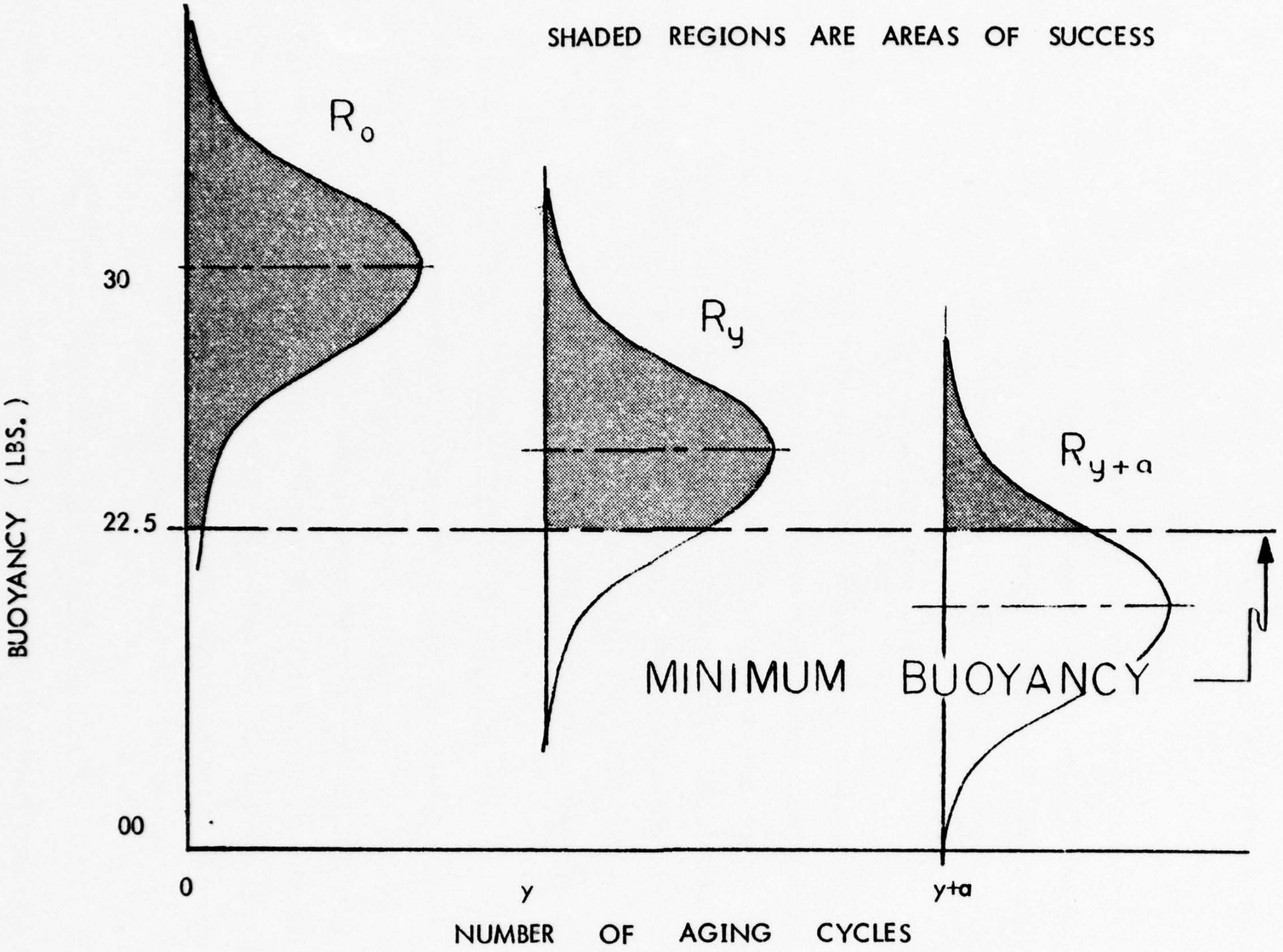

FIGURE 12. RELIABILITY ASSESSMENT

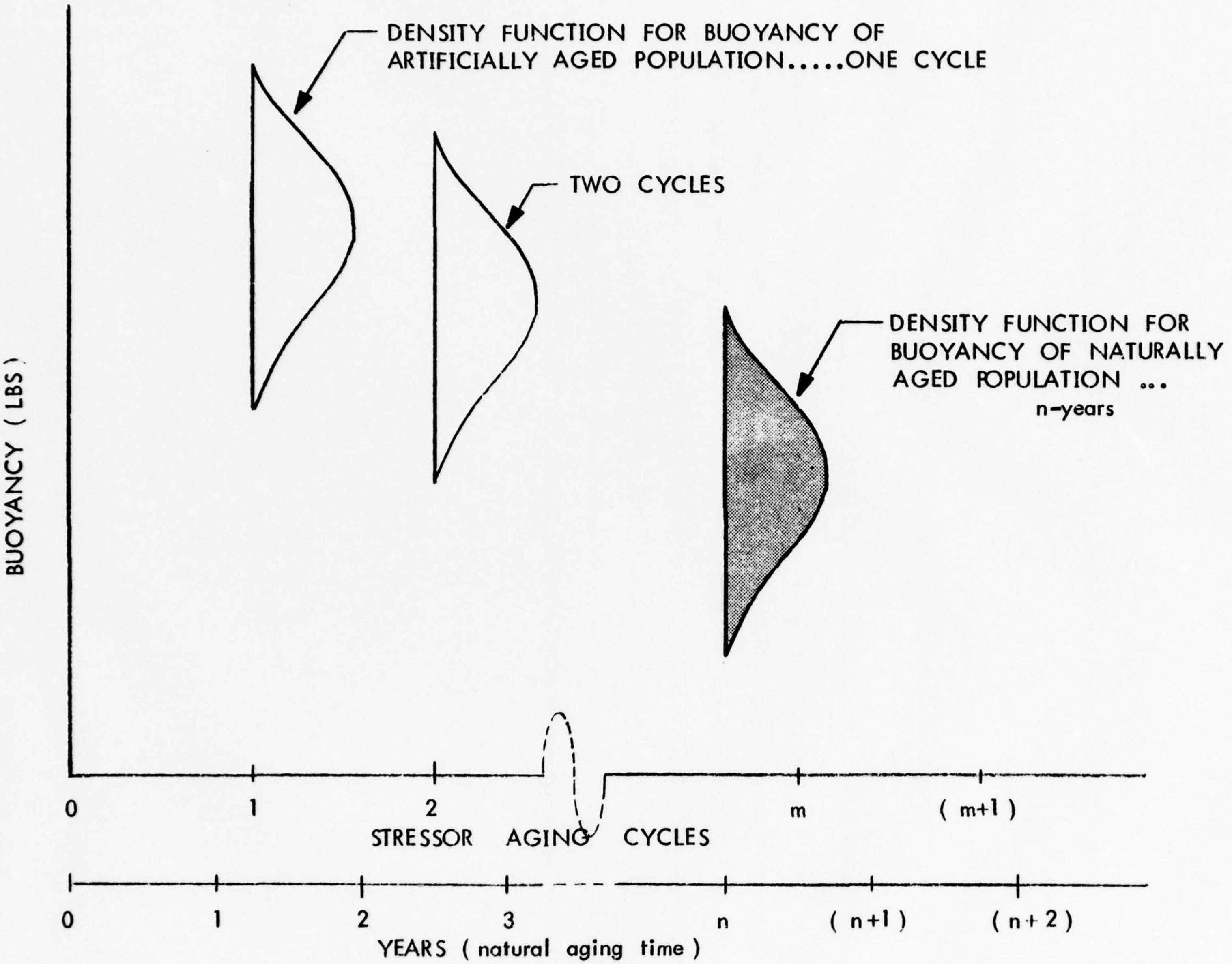

FIGURE 13. RELIABILITY ASSESSMENT AND COMPARISON OF ACCELERATED AGING WITH NATURAL AGING

buoyancy/reliability for the stressor aging cycles. The figure shows a density function for buoyancy after one aging cycle and the density function for the same sample population after two cycles. The process is iterative in that it will be repeated until the test populations's density function approximates that of the naturally aged population. Note that in Step 7, when $R_n = R_y$, the process will be ceased and it will be concluded that (y) cycles of artificial aging corresponds to (n) years of natural aging.

Steps 8, 9, and 10 — Additional Aging, Measurement, and Comparison

From Step 7, when $R_n > R_y$, (y) will be incremented by some number (a) of aging cycles and, again, the population will be assessed and compared. The process is methodical and repetitious but provides good assurance of results. The last item on Figure 6 states that the same procedure would be utilized to simulate the aging of the second naturally aged population of (n+x) years. Figure 14 shows the trend in degradation with increasing cycles of stressor aging. Again, the cycling will be ceased when the reliability of the test sample population is approximately the same as that of the naturally aged population of (n+x) years.

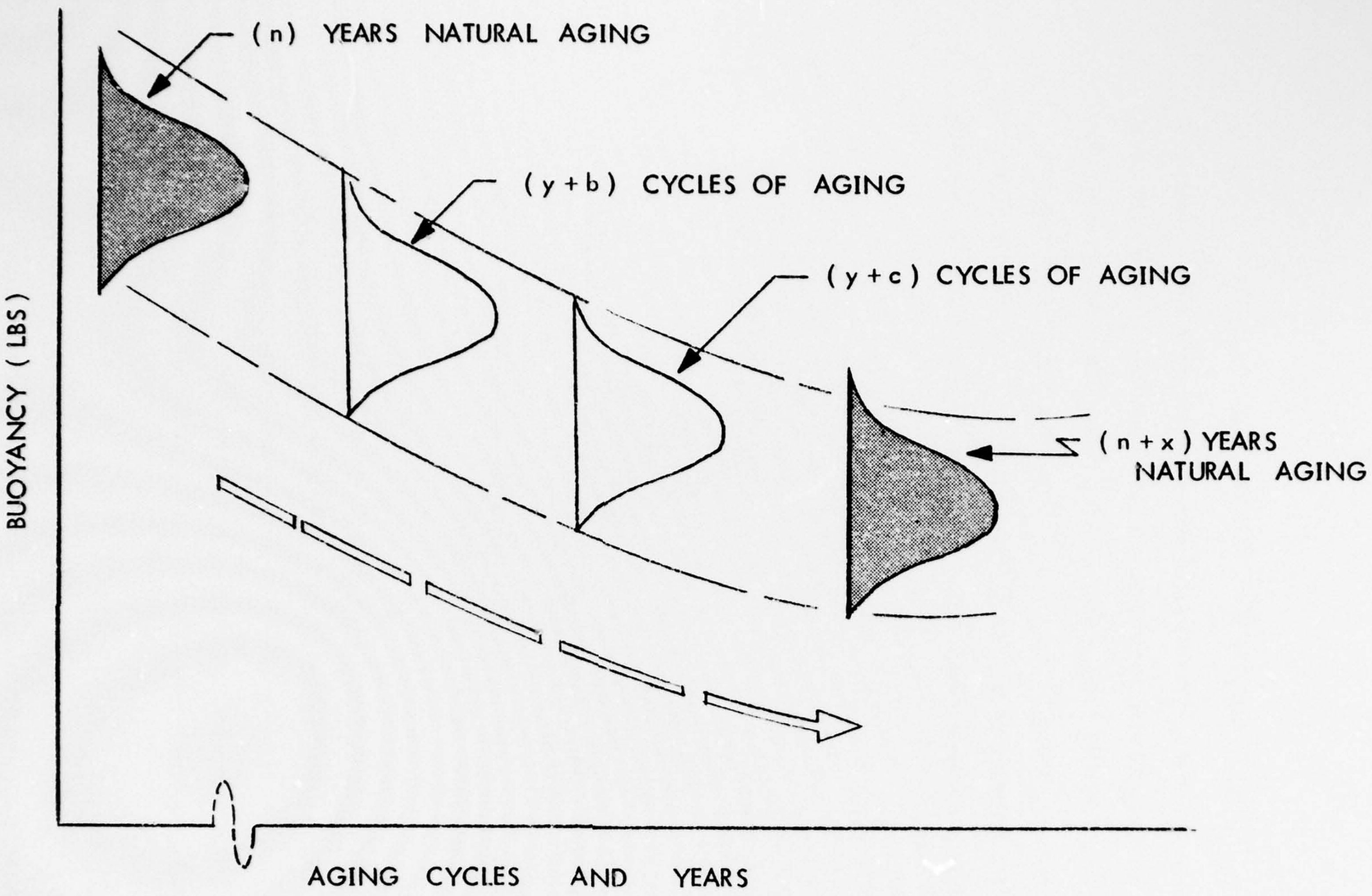

FIGURE 14. FUNCTIONAL RELATIONSHIP BETWEEN STRESSOR AGING AND NATURAL AGING

4.0 OVERSTRESS TESTING

Let us make the assumption that if a PFD will be expected to perform in an environment of stress, x, that it will be designed and constructed with some strength, y, such that $y > x$. In this case the reliability would be 1.00. However, due to imperfections and nonuniformity in materials and processes, the strengths of a group of PFDs are statistically distributed. Also, the stressor factors operating on a given PFD population will, from time to time, vary and, therefore, could be considered a random variable. Figure 15 illustrates this situation.

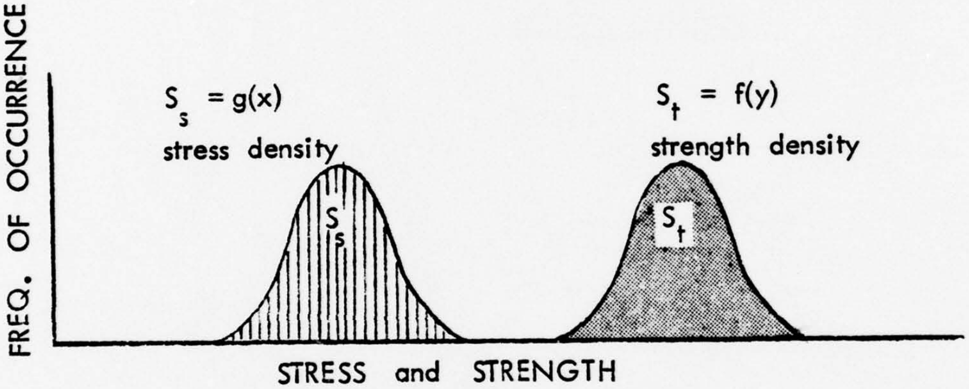

FIGURE 15 , STRESS AND STRENGTH DENSITY FUNCTIONS UNDER NORMAL STRESS CONDITIONS

In overstressing, higher than normally designed for stresses will be applied to the specimen PFDs. Essentially this moves the stress density into the region of the strength density as shown in Figure 16. At this point, the reliability of the sample population will be less than one (e.g. $R < 1.00$). In an extreme case of overstressing, as shown in Figure 17 where the stress density exceeds the strength density, the reliability of the sample population will be zero.

In Figures 15, 16, and 17, it was assumed that the testing was nondestructive since the stressor levels were shown to be increasing and the strength density was relatively constant. In reality, the strength will be degrading with the various environmental stressors, as shown in Figure 18. It is, in fact, this characteristic that is the subject of the analysis. Figure 18 also represents the shift in strength that takes place under wear in normal usage.

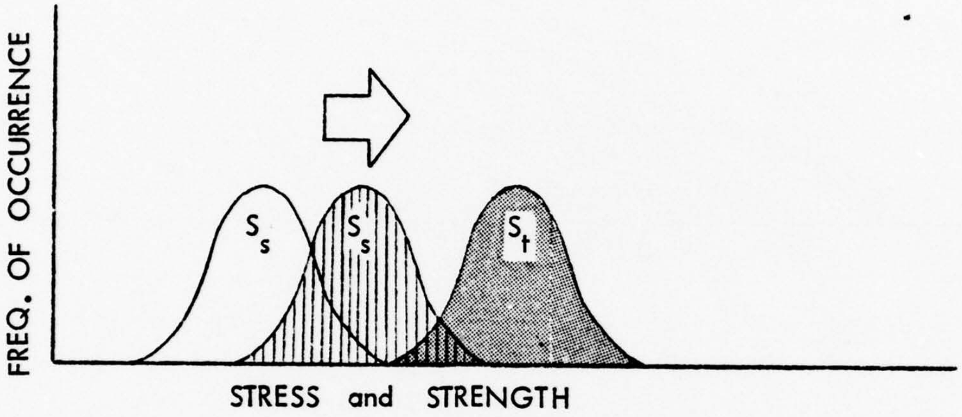

FIGURE 16. STRESS AND STRENGTH DENSITY FUNCTIONS UNDER CONDITIONS OF INCREASING STRESS

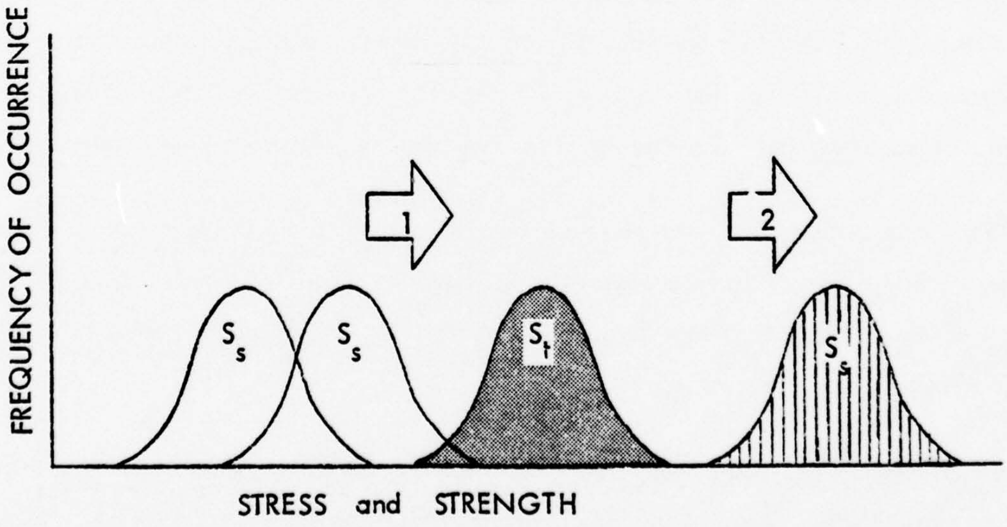

FIGURE 17. STRESS AND STRENGTH DENSITY FUNCTIONS WHERE STRESS EXCEEDS STRENGTH

273

273

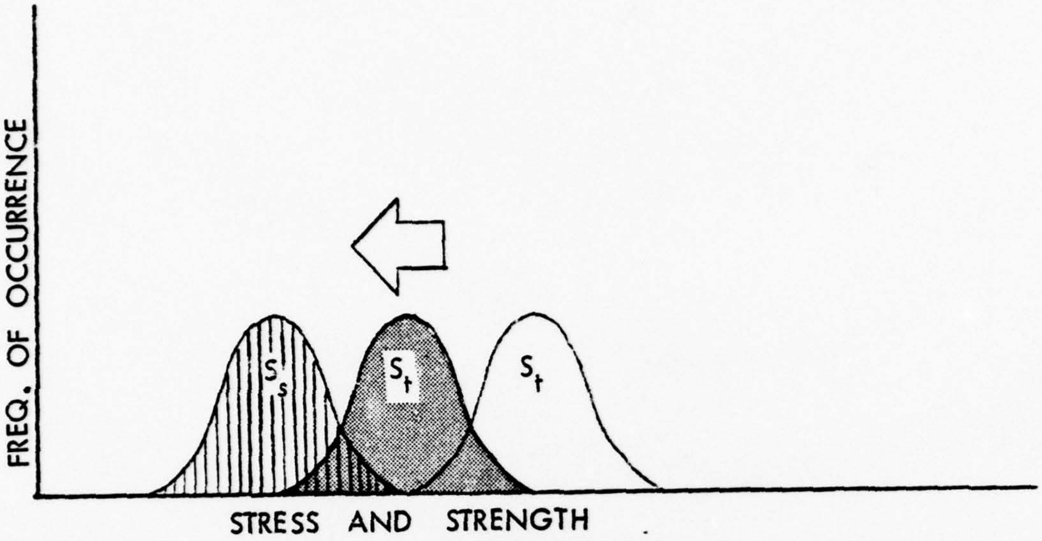

FIGURE 18. STRESS AND STRENGTH DENSITY FUNCTIONS WHERE STRENGTH IS DEGRADING

In accelerated aging, the relationship between the relative movement of the stress (various stressor) density and strength density functions is sought as a predictor of how overstressing in a compressed time frame correlates with normal stressing in a normal time frame. In the Accelerating Aging Process presented in Figure 6, buoyancy as a function of the stressor levels was discussed. Since this is a crucial facet of PFD reliability task, the key idea of aging the new sample population through iterative cycling will be briefly summarized.

Figure 19 shows a comparison between the buoyancy density function of a sample population of (n) years old with a new sample population's buoyancy densities for various aging cycles. It shows that the simulated aging will be terminated after (3y) aging cycles as this corresponds to (n) years of natural aging.

A minimum of two sample populations are essential. Figure 20 depicts the same process for two age groups. In this example (7y) cycles of simulated aging corresponds to (n+5) years of natural aging.

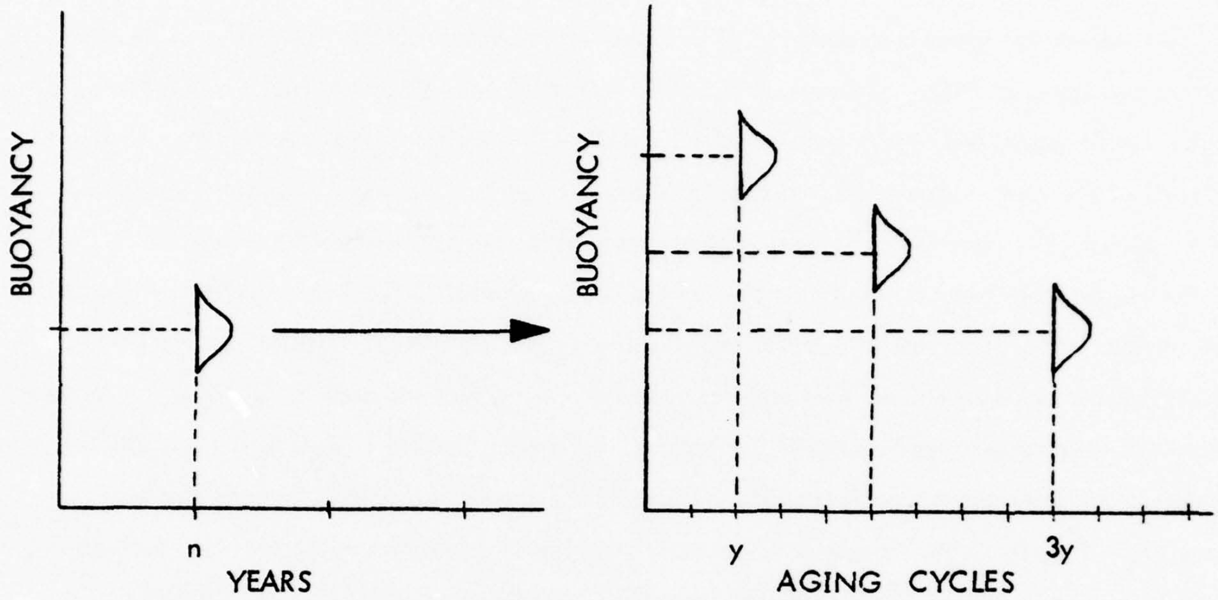
BUOYANCY
n
YEARS
BUOYANCY
y
3y
AGING CYCLES

FIGURE 19. RELATING YEARS TO CYCLES (ONE SAMPLE POPULATION)

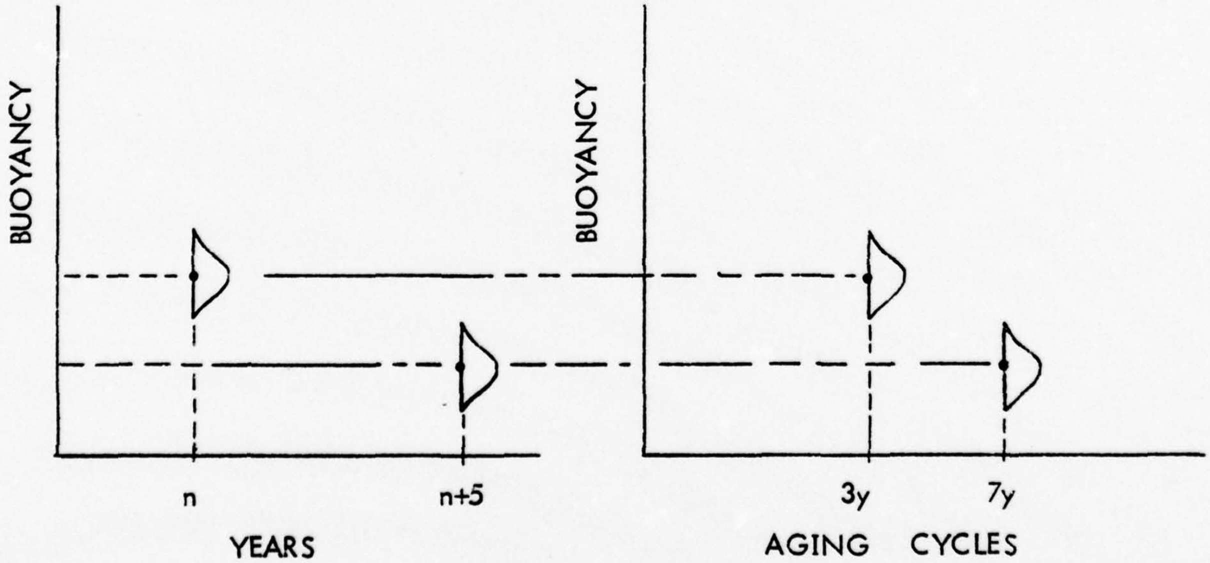
BUOYANCY
n
n+5
YEARS
BUOYANCY
3y
7y
AGING CYCLES

FIGURE 20. RELATING YEARS TO CYCLES (TWO SAMPLE POPULATIONS)

It is expected that an accelerated aging to "real world" aging correlation will be obtained for various types of PFDs and various flotation materials such that the life of any particular make can be predicted by subjecting a sample population to the aging process (Step 8 of Phase I of the current contract). Assuming a goal or standard of useful life can be decided upon (U.S.C.G. decision), for inherently buoyant PFDs, a performance standard for reliability can be obtained both in terms of mission (short-term reliability) and useful life (long-term reliability). This concept is shown in Figure 21. R_g is a short-term or mission goal for the reliability of new PFDs. This is a control of outgoing product quality (acceptance sampling). If the measured reliability of the sample, R_s, is less than R_g, ($R_s < R_g$), then the "make/brand" should not be approved. If the reliability of the sample exceeds the goal (e.g. $R_s > R_g$), but after the sample has undergone the accelerated aging process (derived from this study), fails the life goal, R_l, then the "make/brand" should, again, not be approved. The logic of this process is illustrated in Figure 22.

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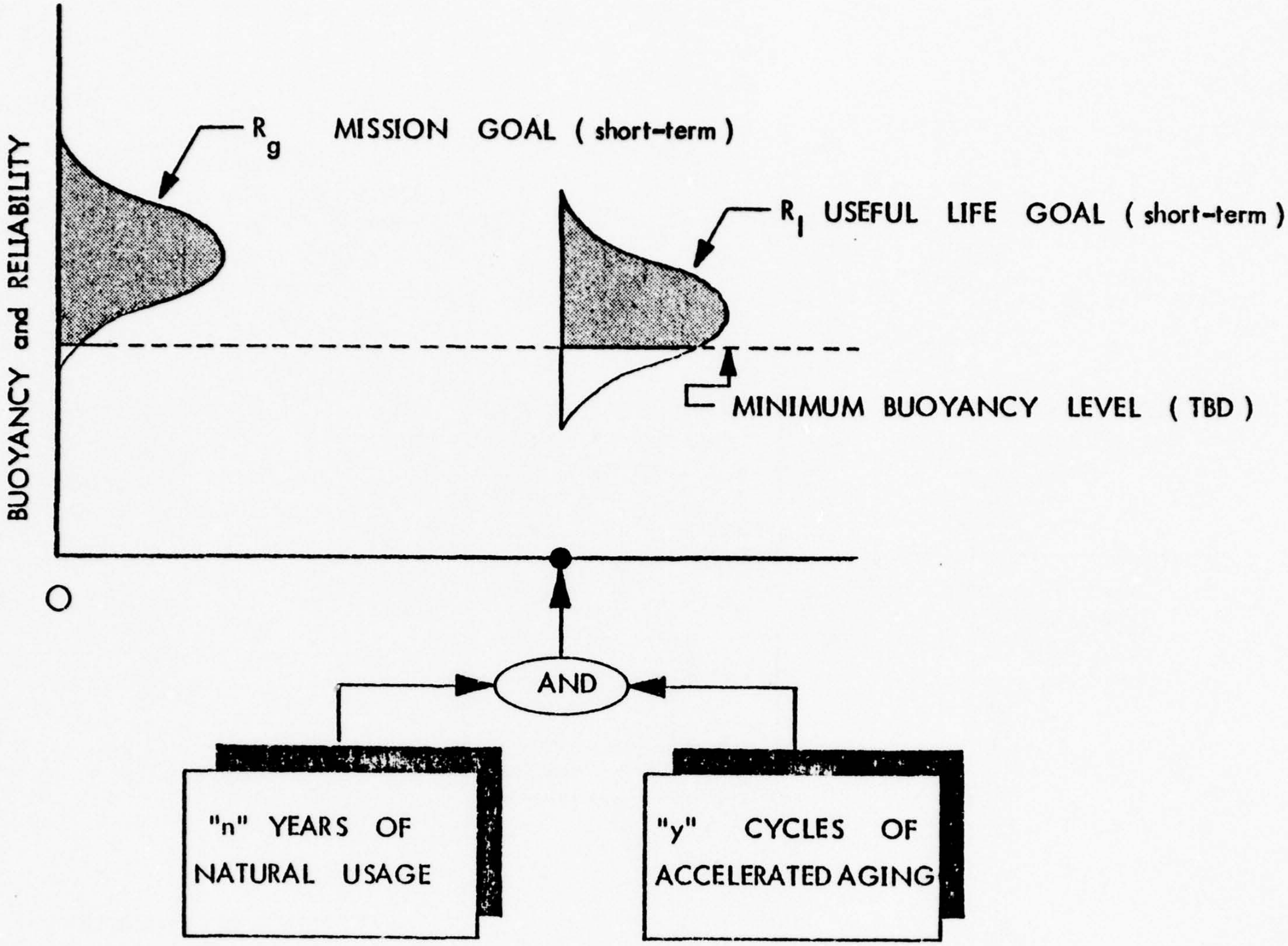

R_g MISSION GOAL (short-term)
R_l USEFUL LIFE GOAL (short-term)
MINIMUM BUOYANCY LEVEL (TBD)
BUOYANCY and RELIABILITY
O
AND
"n" YEARS OF NATURAL USAGE
"y" CYCLES OF ACCELERATED AGING

FIGURE 21. SHORT-TERM AND LONG-TERM RELIABILITY PERFORMANCE STANDARDS

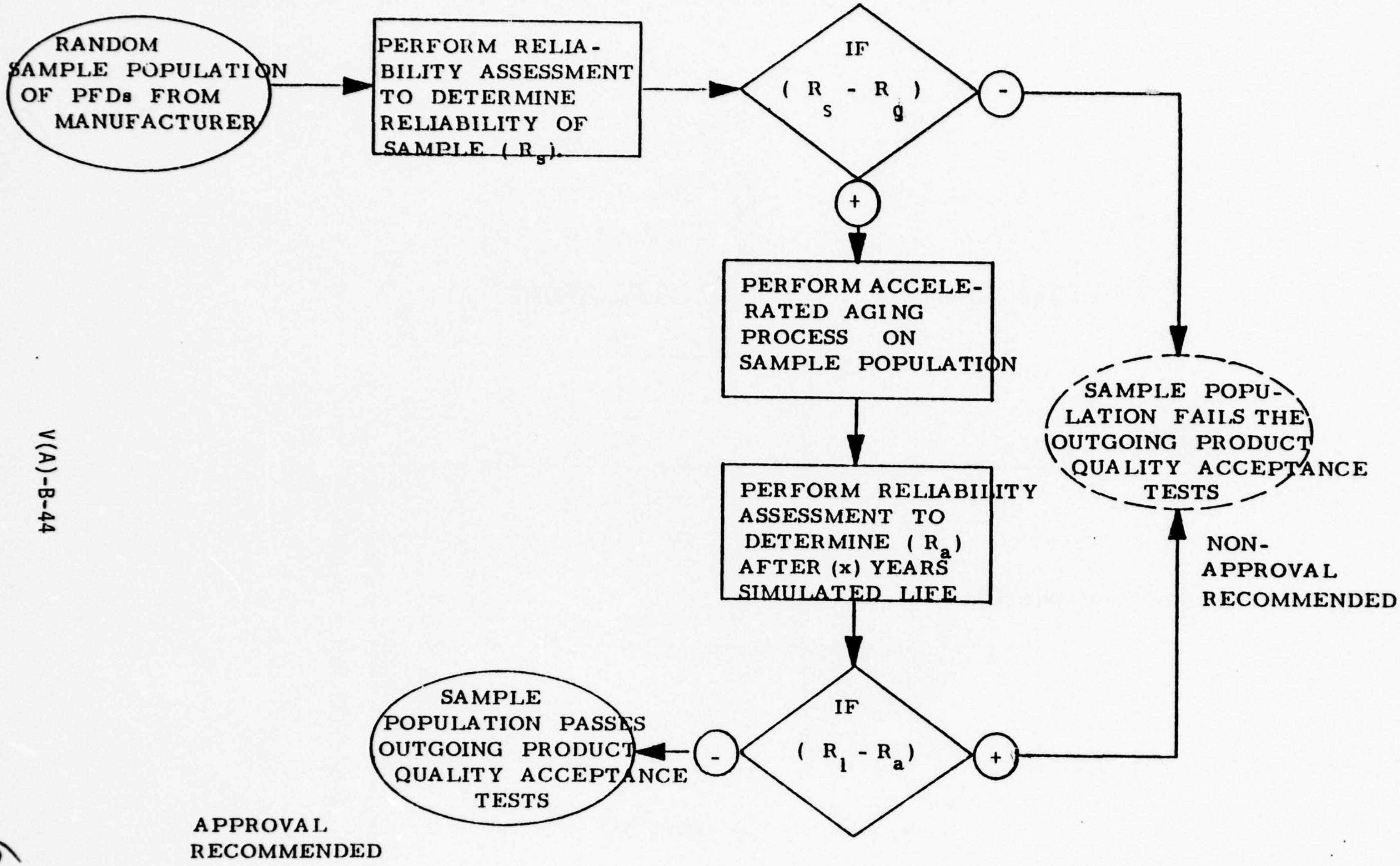

RANDOM SAMPLE POPULATION OF PFDs FROM MANUFACTURER
PERFORM RELIABILITY ASSESSMENT TO DETERMINE RELIABILITY OF SAMPLE (R_s).
IF
(R_s - R_g)
-
+
PERFORM ACCELERATED AGING PROCESS ON SAMPLE POPULATION
PERFORM RELIABILITY ASSESSMENT TO DETERMINE (R_a) AFTER (x) YEARS SIMULATED LIFE
IF
(R_1 - R_a)
-
+
SAMPLE POPULATION FAILS THE OUTGOING PRODUCT QUALITY ACCEPTANCE TESTS
NON-APPROVAL RECOMMENDED
SAMPLE POPULATION PASSES OUTGOING PRODUCT QUALITY ACCEPTANCE TESTS
APPROVAL RECOMMENDED

FIGURE 22. PERFORMANCE STANDARDS APPROVAL PROCESS

APPENDIX V(A)-C - FACTORS AFFECTING PFD BUOYANCY

As a result of various research efforts by Wyle Laboratories, Underwriters' Laboratories, and several manufacturers, several factors besides normal degradation have been found to influence the buoyancy of PFDs. The factors of water temperature, atmospheric pressure, and soak time have all been found to affect the buoyancy of certain PFDs. A discussion of the available information is presented below.

Water Temperature and Atmospheric Pressure

The results from the testing of various foam materials by Underwriter's Laboratories, Wyle Laboratories and various manufacturers have shown that in some instances temperature, pressure and possibly humidity will affect the buoyancy readings obtained. Data was obtained from one manufacturer of a PVC foam on the readings of water temperature and atmospheric pressure at the time buoyancy readings were made. These results were analyzed to determine whether a relationship exists between the two independent variables of temperature and pressure and the dependent variable of buoyancy. The results showed that there existed no significant relationship between the independent and dependent variables when a multiple linear regression was performed.

Contact was also made with a second manufacturer of a PVC foam. The manufacturer of this foam indicated that he had performed a similar experiment and analysis on the effects of temperature and pressure on buoyancy readings. The results indicated that some sort of relationship did exist; however, the relationship did not follow the ideal gas law.

Recently, contact was made with Mr. Samuel Wehr of the office of Merchant Marine Safety on results of temperature and pressure experiments on buoyancy readings of kapok PFDs. He indicated that he had found a relationship between temperature/pressure and buoyancy and that the relationship followed the ideal gas law.

The above results show a wide range of responses of buoyancy mediums to temperature and pressure. This suggests that the effects of temperature and pressure on PFD buoyancy cannot be ignored in many cases if consistently reproducible results are to be obtained. Two methods are available for handling the problem: 1) Establish standard conditions for any factors found to influence PFD buoyancy, and 2) Establish correction factors for buoyancy readings taken under non-standard conditions.

The major problem with method 1, of course, lies with the difficulty of controlling all influencing factors. This difficulty can be alleviated if correction factors can be derived for the non-standard conditions. Underwriters' Laboratories has established in UL 1191 a method for calculating a correction factor for temperature and pressure variations from standard conditions. This correction factor, however, was derived to reflect conditions under the ideal gas law. As reported earlier, the empirical evidence obtained does not support the assumptions found in the ideal gas law. If a correction factor is to be used for correcting to standard temperatures and pressures when measuring buoyancy, the correction factor must be derived to reflect the characteristics of that particular buoyancy medium and not be based purely on theoretical considerations.

Soak Time

The effect of soaking a particular type of PVC foam for a period of 24 hours was examined. Both used and new PFDs were measured for buoyancy prior to and after a 24 hour soak period. The results showed that new PFDs exhibited between 0.1 and 0.2 lbs of buoyancy loss after a 24 hour soak period. The results from the testing of used PFDs that ranged in age from 2 years to 5 years old showed the loss in buoyancy after a 24 hour soak period rose to only 0.3 lbs of buoyancy. No difference was found between those at two years and those at five years.

approximately 3.6 million adult devices could be expected to be sold. Thus, we would have an annual increase in cost of 3.6 million x 14.50 dollars - 52.5 million dollars. This is 52.2 million dollars divided by 105 lives per year, or a cost per life saved of $497 thousand. The latter figure is higher than costs usually accepted by regulatory agencies for safety programs.

TABLE VII-A1. DEVICE COSTS AND MARKET SHARE

Type of PFD		Cost	Estimate of Percent of Approved or Certified PFDs on Board Recreational Boats	
			Currently	20 Yrs After Implementation with Minimum LSI = 0.23
AK-1		$ 7.00	49.5	0.0
Type III Vests		25.00	16.0	45.2
Type III Flotation Jacket		40.00	1.3	3.8
Type IV Rings/Horseshoes		30.00	6.5	0.0
Type IV Cushions		8.00	26.7	0.0
Belt Type Inflatable	Avg. $27.50	20.00	0.0	50.0
Hybrid Vest with about 15 lbs inherent buoyancy		32.50	0.0	
Hybrid Vest with about 10 lbs inherent buoyancy		30.00	0.0	
TOTAL			100.0	100.0
Average Device Cost			$12.07	$26.57
Average Device LSI			0.14	0.26

(316) all

(316)

78C29 20 all

APPENDIX VII-A. COST BENEFIT FOR MINIMUM LSI APPLIED TO ALL DEVICES

This appendix presents the cost and benefit calculation for setting a minimum LSI of 0.23 and allowing existing devices to remain in service until they expire.

The benefit derived from the LSI depends upon how it is applied. If the minimum LSI is set so low that all the currently approved PFDs remain approved or certified, then the benefit will be small. Inspecting the overall LSIs for various types of PFDs in Table VII-A1, we see that the LSI for AK-1s (0.11) is appreciably lower than the others. In order to illustrate the potential benefits of the LPM, we will first assume that the minimum LSI is set at 0.23. This value is used for purposes of illustration only. The determination of the minimum LSI and similar criteria is a policy decision which must be made by the Coast Guard. The purpose of this discussion is simply to illustrate a tool which the Coast Guard can use to evaluate alternative programs. Assuming that the minimum LSI is set at 0.23, AK-1s and Type IVs would no longer be approved or certified.

The percent of various kinds of PFDs on board at 20 years after (assuming all PFDs presently in use but not having LSIs of at least 0.23 are phased out over 20 years) implementation assuming a minimum LSI of 0.23 are shown in Table VII-2. The average overall LSI 20 years after implementation was calculated as discussed earlier for the current population of PFDs on board and equals 0.26.

The maximum benefit of the LSI system is approached 20 years after implementation. At that point, estimated annual benefit as compared to the current PFD approved system is 105 lives per year (see equation in Section VI) for 0.12 change in the LSI.

On the cost side, Table VII-A1 provides cost estimates, in 1975 dollars, for the device types and the market share of those devices in 1975 and after 20 years from Table VII-A1. Table VII-A1 also shows the average device cost in 1975 and 20 years after implementation. Using 1975 as a base year, the average increase in device cost is $14.50, and approximately 7.2 million devices could be expected to be sold (see Figure VII-15) if the devices had the same expected life as the devices sold in 1975. Assuming a 50% increase in expected life occurs as a result of better device design and that 75% of the total device market is adult devices,

SECTION VII - APPENDICES

ANALYSIS OF THE LIFE-SAVING INDEX (LSI) SYSTEM

- APPENDIX VII-A Cost Benefit for Miminum LSI Applied to All Devices

```
FILE DEFINITION RUN FOR ARN DATA                                                        12/05/77      PAGE   15

FILE    ARN       (CREATION DATE =  12/05/77 )    DATA

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * *
    PFDAU      PFD AVAILABLE-USED                                BY  BDW        BODY OF WATER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                 BDW
         COUNT  I
       ROW PCT  IRIVER-CR LAKE-SWA GREAT LA COASTAL   OCEAN        ROW
       COL PCT  IEEK      MP       KE       WATERS                 TOTAL
       TOT PCT  I     1.0I     2.0I     3.0I     4.0I     5.0I
PFDAU  --------I--------I--------I--------I--------I--------I
         ~~2.0~~  I  81858 I  75131 I  17250 I  44452 I  12437 I231128
                I   35.4 I   32.5 I    7.5 I   19.2 I    5.4 I  16.0
      USED      I   18.4 I   15.9 I   25.4 I   12.2 I   12.9 I
                I    5.7 I    5.2 I    1.2 I    3.1 I     .9 I
               -I--------I--------I--------I--------I--------I
         ~~3.0~~  I 363033 I 398686 I  50736 I 319924 I  83793 I*12161
                I   29.9 I   32.8 I    4.2 I   26.3 I    6.9 I  84.0
      NOT       I   81.6 I   84.1 I   74.6 I   87.8 I   87.1 I
      USED      I   25.1 I   27.5 I    3.5 I   22.1 I    5.8 I
               -I--------I--------I--------I--------I--------I
        COLUMN    444891   473817    67986   364376    96230  1447300
         TOTAL      30.7     32.7      4.7     25.2      6.6    100.0

RAW CHI SQUARE = 10966.31401 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =       0
CONTINGENCY COEFFICIENT =      .08672
UNCERTAINTY COEFFICIENT (ASYMMETRIC) =  .00839 WITH PFDAU   DEPENDENT.   =  .00263 WITH BDW   DEPENDENT.
NUMBER OF MISSING OBSERVATIONS =  534083
```

Adjusted $\chi^2_4 = 10966 \times \frac{1}{100} \times (0.0778)$

$= 8.53$

$0.06 < p < 0.09$

(312)

(312)

```
FILE DEFINITION RUN FOR ARM DATA                                                  12/05/77      PAGE   13

FILE    ARM      (CREATION DATE =  12/05/77 )   DATA

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
    PFDAU     PFD AVAILABLE-USED                                        BY  WC        WATER CONDITION
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                   WC
          COUNT   I
          ROW PCT I                                            ROW
          COL PCT I                                            TOTAL
          TOT PCT I    1.01      2.01      3.01      4.01
PFDAU     --------I--------I--------I--------I--------I
                  I 90908  I 99673  I 40547  I      0  I231128
     USED         I  39.3  I  43.1  I  17.5  I      0  I  16.0
                  I  12.5  I  18.3  I  34.2  I      0  I
                  I   6.3  I   6.9  I   2.8  I      0  I
                 -I--------I--------I--------I--------I
                  I636097  I445703  I  77935 I  56437 I*12161
     NOT          I  52.3  I  36.6  I   6.4  I    4.6 I  84.0
     USED         I  87.5  I  81.7  I  65.8  I  100.0 I
                  I  44.0  I  30.8  I   5.4  I    3.9 I
                 -I--------I--------I--------I--------I
          COLUMN   727005   545376    118482     56437  1447300
          TOTAL     50.2     37.7       8.2       3.9    100.0

RAW CHI SQUARE = 48807.34098 WITH     3 DEGREES OF FREEDOM.  SIGNIFICANCE =      0
CONTINGENCY COEFFICIENT =      .18062
UNCERTAINTY COEFFICIENT (ASYMMETRIC)  =  .04114 WITH PFDAU   DEPENDENT.   =   .01729 WITH WC   DEPENDENT.
NUMBER OF MISSING OBSERVATIONS =  534083
```

Adjusted $\chi^2_3 = 48807 \times \frac{1}{100} \times (0.0778)$

$= 37.97$

$p = 10^{-7}$

```
FILE DEFINITION RUN FOR ARH DATA                                                        12/05/77      PAGE   15

FILE   ARH        (CREATION DATE =  12/05/77 )    DATA

* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * * * *
     PFDAU       PFD AVAILABLE-USED                                   BY  BDW          BODY OF WATER
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                  BDW
          COUNT  I
        ROW PCT  IRIVER-CR LAKE-SWA GREAT LA COASTAL  OCEAN       ROW
        COL PCT  IEEK      MP       KE       WATERS             TOTAL
        TOT PCT  I     1.0I     2.0I     3.0I     4.0I     5.0I
PFDAU   ---------I--------I--------I--------I--------I--------I
             2.0 I 81858  I 75131  I 17250  I 44452  I 12437  I231128
                 I  35.4  I  32.5  I   7.5  I  19.2  I   5.4  I 16.0
        USED     I  18.4  I  15.9  I  25.4  I  12.2  I  12.9  I
                 I   5.7  I   5.2  I   1.2  I   3.1  I    .9  I
                -I--------I--------I--------I--------I--------I
             3.0 I363033  I398686  I 50736  I319924  I 83793  I*12161
                 I  29.9  I  32.8  I   4.2  I  26.3  I   6.9  I 84.0
        NOT      I  81.6  I  84.1  I  74.6  I  87.8  I  87.1  I
        USED     I  25.1  I  27.5  I   3.5  I  22.1  I   5.8  I
                -I--------I--------I--------I--------I--------I
         COLUMN   444891   473817    67986   364376    96230  1447300
          TOTAL     30.7     32.7      4.7     25.2      6.6   100.0

RAW CHI SQUARE = 10966.31401 WITH     4 DEGREES OF FREEDOM.  SIGNIFICANCE =        0
CONTINGENCY COEFFICIENT =       .08672
UNCERTAINTY COEFFICIENT (ASYMMETRIC) =   .00839 WITH PFDAU    DEPENDENT.     =   .00263 WITH BDW    DEPENDENT.
NUMBER OF MISSING OBSERVATIONS =  534063
```

Adjusted $\chi^2_4 = 10966 \times \frac{1}{100} \times (0.0778)$

$= 8.53$

$0.06 < p < 0.09$

(312)

(312)

```
FILE DEFINITION RUN FOR AR4 DATA                                                    12/05/77      PAGE    1

FILE    ARM      (CREATION DATE =  12/05/77 )    DATA

* * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * * *
    PFDAU      PFD AVAILABLE-USED                                    BY  AGE
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *  PAGE  1 OF  1

                  AGE
        COUNT   I
       ROW PCT  IADULT     TEENAGER CHILD                          ROW
       COL PCT  I                                                  TOTAL
       TOT PCT  I      1.0I      2.0I      3.0I      4.0I
PFDAU          --------I---------I---------I---------I---------I
                       I146850   I 20216   I  8936   I 55124   I231126
                       I  63.5   I   8.7   I   3.9   I  23.8   I  16.0
          USED         I  18.5   I  16.4   I  19.4   I  11.4   I
                       I  10.1   I   1.4   I    .6   I   3.8   I
                      -I---------I---------I---------I---------I
                       I647814   I103425   I 37117   I427818   I1216174
                       I  53.3   I   8.5   I   3.1   I  35.2   I  84.0
        NOTUSED        I  81.5   I  83.6   I  80.6   I  88.6   I
                       I  44.8   I   7.1   I   2.6   I  29.6   I
                      -I---------I---------I---------I---------I
         COLUMN         794664    123641     46053    482942   1447300
         TOTAL            54.9       8.5       3.2      33.4     100.0

RAW CHI SQUARE = 11617.8424 WITH      3 DEGREES OF FREEDOM.   SIGNIFICANCE =         0
CONTINGENCY COEFFICIENT =        .08926
UNCERTAINTY COEFFICIENT (ASYMMETRIC) =    .00954 WITH PFDAU    DEPENDENT.      =   .00413 WITH AGE   DEPENDENT.
NUMBER OF MISSING OBSERVATIONS =  534083
```

Adjusted $\chi^2_3 = 11618 \times \frac{1}{100} \times (0.0778)$

$= 9.04$

$p \approx 0.029$

310

310

APPENDIX VI-C

EXAMPLE CONTINGENCY TABLES USED IN SELECTING C-VARIABLES FOR USE IN MULTISTATE BENEFIT CALCULATIONS

The following three tables are just a few of the hundreds of crosstabulations used in selecting the C-state variables which were used in multistate benefit estimations.

The counts represent victim populations multiplied by a factor of one hundred. As described elsewhere in the report, this factor was required in order for the SPSS computer program to properly weight the ARM sample victim frequencies. Each raw chi-square value was adjusted for this factor by multiplying it by $(\frac{1}{100})$. A second factor was also used to adjust for the victim weighting. In the case of the PFD use benefit estimations, this factor was 0.0778, the ratio of the (unweighted) ARM sample size for when PFD use was known (1126) to the corresponding weighted population size (14,473). No adjustment was needed for the uncertainty coefficients as these statistics are independent of sample size. Note that the uncertainty coefficients "With PFDAU Dependent" were the ones applicable to our analyses.

single variable 0= ≃ $E_H = E_W = E$) and brought outside the brackets. In that case, there would be no way to compensate, and the LSI would have to be low. Likewise, if wearability and accessibility were both very low, there would be no way to avoid a low LSI.

In fact, reliability tests for existing devices, and data from the Accident Recovery Model (see Section VI) indicate that reliability is typically very high (0.97 or greater) for inflatables and fixed flotation PFDs. This is based upon a definition of reliability in terms of minimum effectiveness and design standards. For example, a PFD which was designed to give only five pounds of buoyancy and gave five pounds, would not have a high reliability, since five pounds of buoyancy is not sufficient for most of the boating population (i.e., it does not meet minimum standards).

Since the available data on reliability indicate that it tends to be high, this allows the manufacturer to change the parameters of effectiveness, accessibility, and wearability of his device to increase the LSI value for his PFD. If his device is designed to be held, for example, he can improve the LSI value for his device by making it accessible, very effective when held and making it easy to hold. He thereby forces much of the burden in the LSI calculation on the third term within the brackets of the LSI formula, where I_{AC}, P_H, and E_H have been improved. Another option to the same manufacturer would be to increase the effectiveness of his device when worn, and/or increase its wearability. He may choose to exercise both options.

Once the LSI parameter values for a given PFD were determined, the areas within the LSI function which would provide the greatest opportunity for improving the life saving capability of the device (and its LSI value) could be determined. Then a manufacturer could choose to work to improve his device in those areas.

1) $R = 1.0$

2) $I_W + I_{AC} = 1.0$

3) $E_W = 1.0$ and/or $E_H = 1.0$ (NOTE: If $I_{AC} > 0$ and $P_H > 0$, then E_W and E_H must = 1.0 for LSI to equal 1.0; otherwise only E_W must = 1.0 for LSI to equal 1.0 when $I_{AC} = 0$ or $P_H = 0$, and only E_H must = 1.0 when $I_{AC} = 1.0$ and $P_H = 1$.)

Thus, when LSI = 1.0, reliability and effectiveness must be at their maximal values. Wearability and accessibility are free to vary, so long as any device which is not worn is accessible. The probability that a device is donned in the water is not constrained. The probability of holding must be 0.0 when $I_{AC} > 0$ and $E_H < 1.0$ in order for LSI = 1.0.

In the case where there are no benefits from PFDs, an LSI = 0 assumption was made. As with the maximal benefit assumption (LSI = 1.0), the LSI can be made to equal 0 in many ways. If reliability equals zero, then LSI equals zero, regardless of the values of the other parameters. If $R > 0$, then each of the three parts of the sum inside the brackets of the LSI equation must equal zero in order for the LSI to equal zero. These three parts of the sum inside the brackets will each be zero if the effectiveness parameters are zero (E_W and E_H). If the index of accessibility (I_{AC}) is zero, or the probability of donning (P_D) is one, then $E_W = 0$ is sufficient to cause LSI = 0. Likewise, if $P_D = 0$ and $I_{AC} = 1$, then $E_H = 0$ is sufficient to cause LSI = 0. When the effectiveness parameters are not zero, I_W must be 0 (assuming $E_W > 0$), and/or I_{AC} must be 0 (assuming $E_H > 0$).

What we have shown in this discussion, is that the LSI is very sensitive to large changes in reliability. If reliability is very low, there is no way to compensate for that in the formula. The maximum value of the sum in the brackets in the LSI formula can be shown to be 1.0. Thus, when reliability is very low, the LSI is forced to be low. This is not (theoretically) true for other parameters. If wearability is very low, this can be compensated for by making effectiveness, accessibility, and reliability very high. Similarly, if effectiveness is low when the device is worn, then the LSI can be increased by improving: effectiveness when held, reliability, and accessibility. Of course, if the effectiveness when worn or held is very low, then the effectiveness terms can be treated as a

APPENDIX VI-B. THEORETICAL EXPLORATION OF EXTREME LSI VALUES

For one of the benefit estimation problems in Section VI (relating benefits to average LSI), values of zero and one were used to determine extreme relationships for the LSI. The discussion that follows explores the theoretical possibilities that could generate such extreme values on the LSI. This discussion is not meant to reflect actual parameter values. It is aimed at a working understanding of the LSI formula and its sensitivity to changes in PFD parameters.

As defined previously,

$$LSI = [I_W \cdot E_W + I_{AC} \cdot P_D \cdot E_W + I_{AC} \cdot P_H \cdot E_H] \cdot R$$

where

I_W = The probability that the PFD is worn immediately prior to entering the water in an accident.

I_{AC} = The probability that the PFD is accessible to a boater but not worn immediately after entering the water in an accident.

P_D = The probability that the accident victim dons the PFD in the water.

P_H = The probability that the accident victim holds or lies upon the PFD in the water

E_W = The physical effectiveness of the PFD when worn.

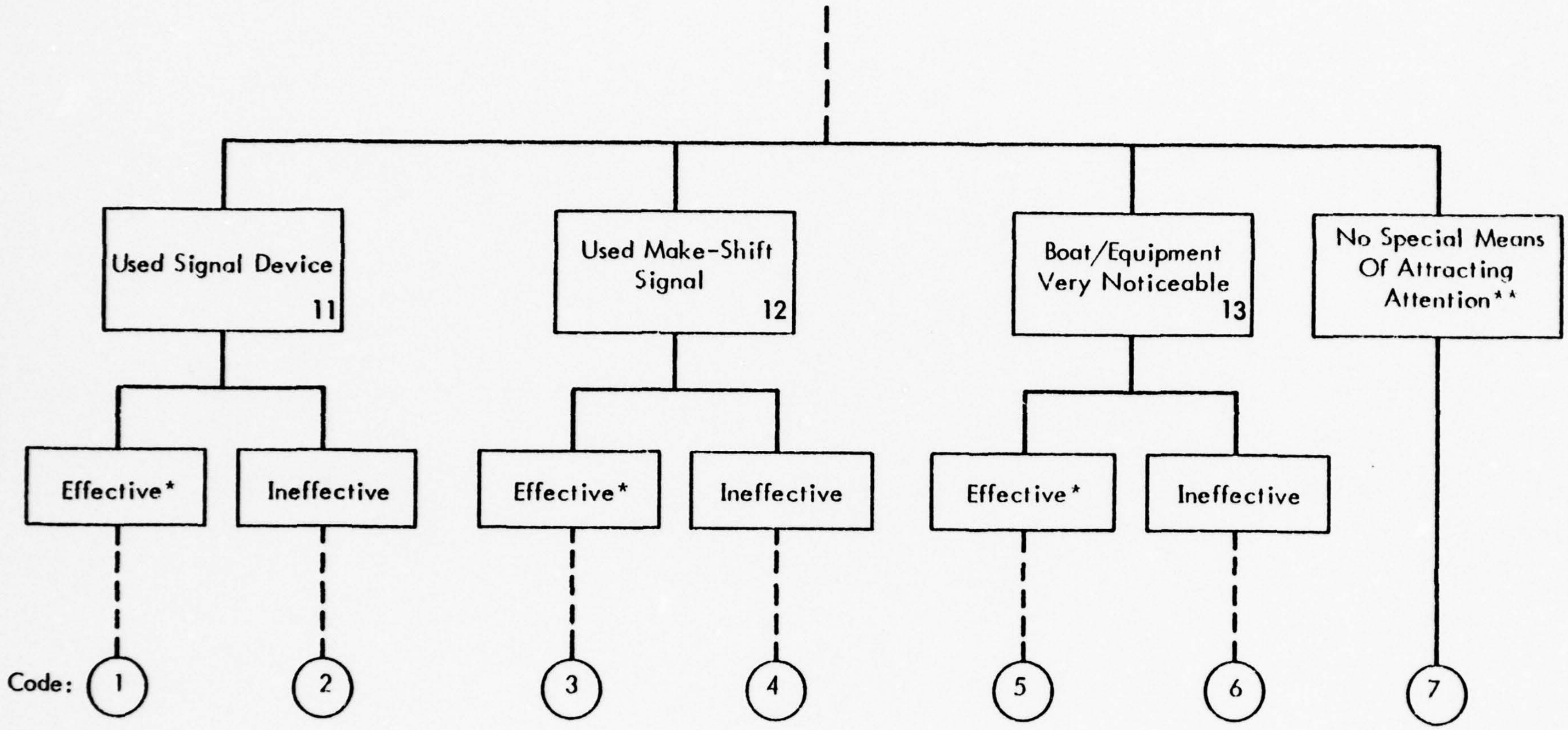
E_H = The physical effectiveness of the PFD when held.

R = The index of reliability; i.e., the probability that the PFD performs up to minimum design standards.

In the case of estimating the maximum possible benefits from PFDs, an average LSI of 1.0 was assumed. Obviously, this can only be obtained when $R = 1.0$, and the average device is extremely reliable. Currently approved PFDs are not too far from attaining this value.

From this point on, the analysis could go in many directions, since there are many ways that the total inside the brackets of the equation could be 1.0.

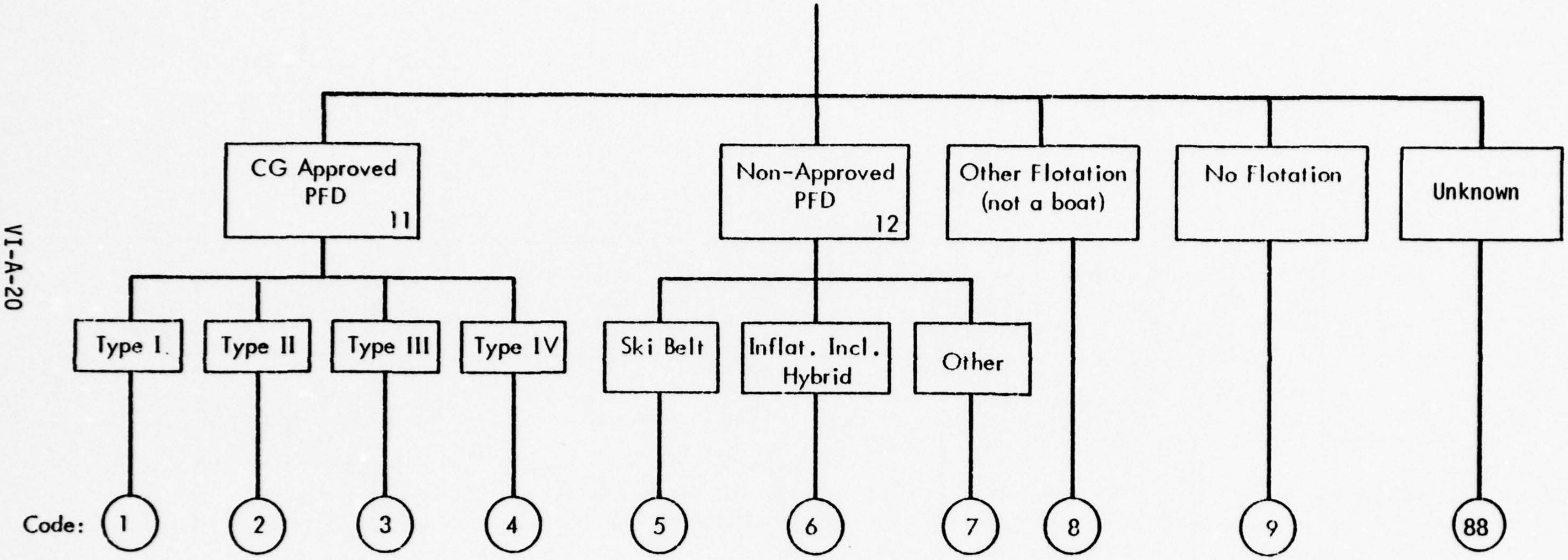
Let us assume, for the moment, that a perfectly wearable device was designed. Then $I_W = 1$ and $I_{AC} = 0$. Thus, E_W would have to be 1.0, and the device would have to be perfectly effective. In fact, by inspection of the equation, it can be seen that, in order for LSI to equal 1.0, under any circumstances:


Used Signal Device
11
Used Make-Shift Signal
12
Boat/Equipment Very Noticeable
13
No Special Means Of Attracting Attention**
Effective*
Ineffective
Effective*
Ineffective
Effective*
Ineffective
Code:
1
2
3
4
5
6
7

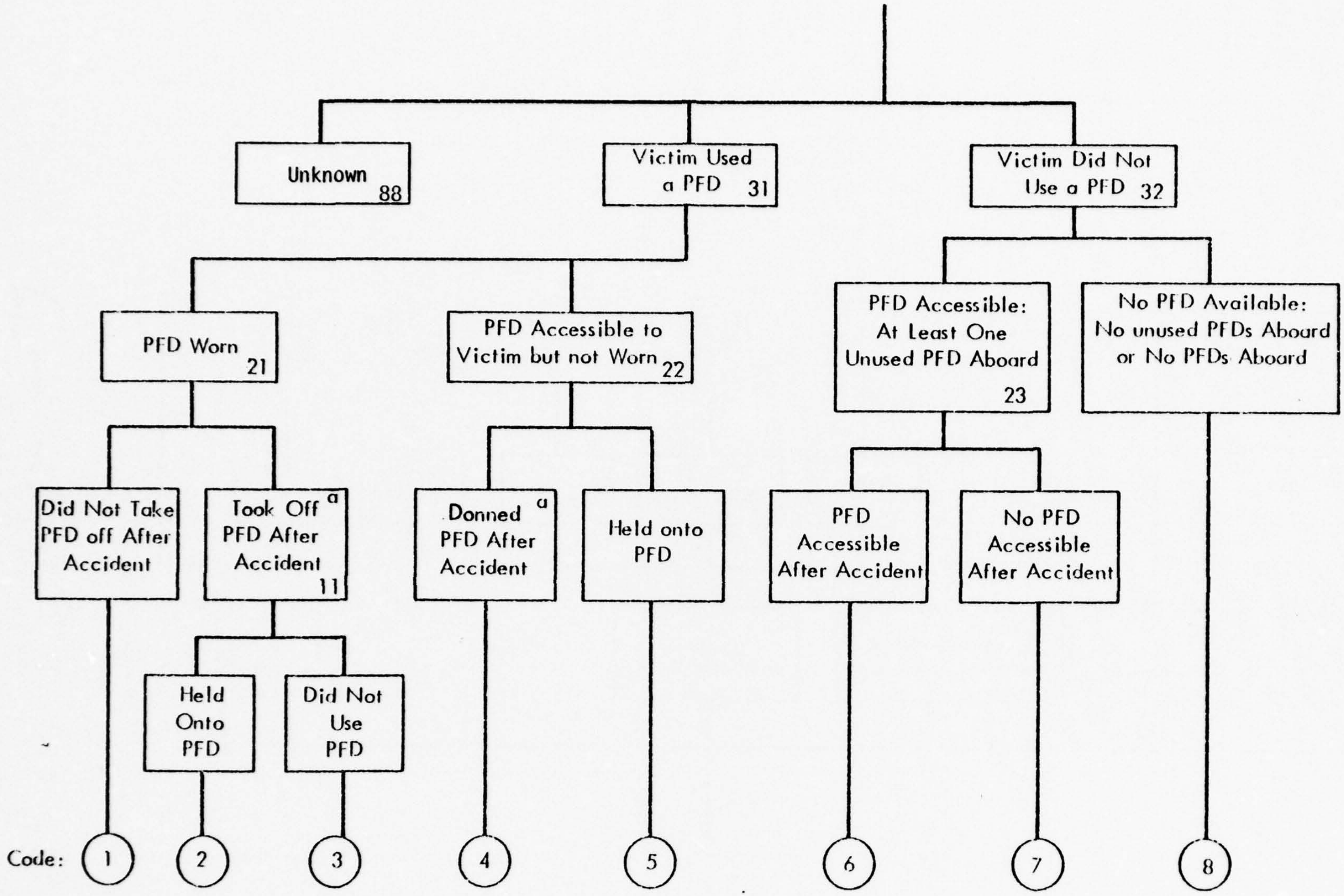
* A signal is considered effective if anyone recognizes it as a sign of distress.

** Hand-waving, shouting, waving a piece of clothing or PFD should be coded "7."

DISTRESS NOTIFICATION (VARIABLE 36)


CG Approved PFD
11
Non-Approved PFD
12
Other Flotation (not a boat)
No Flotation
Unknown
Type I.
Type II
Type III
Type IV
Ski Belt
Inflat. Incl. Hybrid
Other
Code:
1
2
3
4
5
6
7
8
9
88

TYPE OF PFD, IF ANY, USED BY VICTIM (VARIABLE 33)


Unknown 88
Victim Used a PFD 31
Victim Did Not Use a PFD 32
PFD Worn 21
PFD Accessible to Victim but not Worn 22
PFD Accessible: At Least One Unused PFD Aboard 23
No PFD Available: No unused PFDs Aboard or No PFDs Aboard
Did Not Take PFD off After Accident
Took Off PFD After Accident a 11
Donned PFD After Accident a
Held onto PFD
PFD Accessible After Accident
No PFD Accessible After Accident
Held Onto PFD
Did Not Use PFD
Code:
1
2
3
4
5
6
7
8

a - Code time until PFD was donned or taken off as variable 31.

PFD AVAILABILITY AND USE (VARIABLE 30)

APPENDIX VI-A

A.R.M. ANALYST'S GUIDE

The pages that follow contain much of the information that you will need to analyze accidents for ARM and fill out the code sheets.

The first four pages contain general information about ARM (its intent and purpose). These pages are followed by a sample coding sheet from 1976. You will be filling out coding sheets very much like this one, with a few more columns at the end for additional information. Read these pages and examine the coding sheet. Additional helpful information can be found on the pages immediately following the coding instructions.

The remaining pages show you exactly how to code all of the information required by ARM. A row on the coding sheet is to be completely filled out for each accident victim that is coded into ARM.

The flowchart that is attached indicates precisely what you are to do.

1. Select a Boating Accident Report from the "batch" given to you. Keep these in order and process them in order.
2. Decide whether the accident involved all of the people on board or a subset of those people. Capsizings, swampings, sinkings, collisions, fires, explosions, and some "others" typically involve all of the POB. Falls overboard, hit by the prop, and some "others" typically involve only one or two of the people on board. In ARM, we want to code information only for those people who actually were involved in an accident.
3. Record (code) the data – more on this later.
4. Eventually both coders will have completed a batch. You will both be coding the same accidents. When a batch is completed, you will get together and compare codings. Any disagreements will be ironed out at that time. When a consensus is reached, present the coded batch to the project analyst and pick up the next batch.

ACCIDENT RECOVERY MODEL

Introduction

Research sponsored by the U. S. Coast Guard has examined a variety of problems related to accident prevention and recovery in recreational boating. For example, extensive investigations have been made concerning collisions, fires and explosions, flotation, boat stability, and the use and functioning of personal flotation devices (PFDs).

These investigations have revealed some of the more subtle problems and relationships involved in accident recovery and prevention. It has become increasingly clear that the occurrence of an accident, and recovery or fatality after an accident, are the results of a complex system of events and conditions. Some of the elements in the system are physical; others are psychological, physiological, economic, or social. For example, the factors which determine whether an accident results in recovery or a fatality can be categorized as follows:

- Accident dynamics, i.e., the type of accident, how quickly it occurs, etc.
- Physiological state of the victims, i.e., the presence of injury, shock etc, obviously have a great bearing on the probability of recovery.
- Behavior of the victims, e.g., use or non-use of PFDs.
- Environment, e.g., water temperature, water conditions.
- Rescue facilities – there are a variety of possible modes of rescue, including self-rescue, rescue by another boater on the scene, or rescue by the Coast Guard or other agency.
- Equipment – includes types of PFDs available, signalling devices, etc.

The recognition of the complexity of the factors determining accident occurrence and recovery or fatality has led to a desire for better understanding of these systems. It has occurred to workers in this area that there may be effective

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ways of reducing accidents or promoting more favorable outcomes which have gone unrecognized. There is also a growing realization that actions which superficially would be expected to produce benefits could have unexpected and undesirable ramifications. For example, improving the stability of small boats could result in a tendency for boaters to use them under conditions they would have otherwise avoided, thus possibly increasing the probability of an accident.

The work has taken the form of an Accident Recovery Model (ARM). This model describes the functioning and interrelationships of the elements of the accident recovery system. Some of these elements include: PFDs, boat flotation, rescue facilities, signalling devices, boaters' behavior, injury and other physiological conditions, and emergency treatment.

ARM is used to generate quantitative estimates of the benefits associated with proposed or existing regulatory or educational programs. For example, ARM can help to provide answers to the following questions:

1) Would it be beneficial to modify PFD design in the direction of greater "wearability" (e.g., comfort, attractiveness, etc) even if this dictates a decrease in their physical effectiveness?

2) Would increased accessibility of PFDs help to compensate for the low rate of PFD wear?

3) Should PFDs provide greater protection against hypothermia?

4) Should PFDs be designed so that they are easy to don after the victim is in the water?

5) How might education increase recovery? For example, is the maxim "stay with your boat" always the best course of action?

6) How will improved boat flotation affect the role of PFDs in accident recovery?

During the formulation of ARM, three general methodological principles or objectives emerged. These three principles gave direction to the development of the model and helped to insure that the final product was useful.

The first of these principles was that the model must be empirical. It is based upon documented cases of recovery or fatality in recreational boating accidents rather than assumption or expert opinion. By building the model on an empirical base, one can have greater confidence that the result is a valid representation of the way recoveries and fatalities occur. ARM involves relatively few assumptions. Furthermore, these assumptions were checked and modified, as needed, as the additional data were gathered. ARM changed and grew to fit the data. In fact, ARM can be regarded as a structured summary of boating accident recovery data.

A second principle was that ARM must summarize the common elements in accident recovery, while at the same time not sacrificing important relationships. In any type of modelling or analysis problem, there is a trade-off between summarization and representing detail. At one extreme, the average number of fatalities per accident could be regarded as a model. Obviously, this method sacrifices too much detail for an overall summary. The other extreme would be a detailed account of each of the accidents which occurred, say, in 1974. This alternative doesn't sacrifice any details, but fails to point out commonalities among accident recoveries or fatalities. The model was developed in such a way as to capture important relationships among elements of the accident recovery system that are common to many accidents.

The third criterion for ARM was that it must be in a form which is usable by the Coast Guard. This means that events or conditions which the Coast Guard can control by regulation, standards, or education must appear as elements of the model. This criterion also implies that the model must make use of existing accident data, even though such data is often incomplete and not representative of the population of boating accidents to be modeled.

ARM consists of a coding sheet and decision trees which treat six different portions of the recovery problem. Each row on the coding sheet summarizes the information for a single individual, or "victim", involved in a boating accident. After a sufficiently large number of victims are coded, the information can be punched on cards and processed by computer.

The numbers along the top of the coding form represent variable numbers. There are three types of variables: Variables numbered 1 - 7 contain file information which serves to locate the source in Wyle or Coast Guard files. Variables 8 - 23 provide miscellaneous recovery-related information and the information which will be needed to scale ARM data to reflect the population of boating accidents at large. The last group of variables (24 - 51) contain the major recovery-related information. The values to be coded for variables numbered 24, 26, 28, 30, 33 and 36 are obtained from the accompanying decision trees.

It should be noted that the conditions represented in each of the ARM decision trees were not chosen arbitrarily. The combinations of conditons shown in each tree are (or should be interpreted as) mutually exclusive possibilities. In other words, only one set of conditions in a given decision tree can apply to any one victim.

Wyle or BAR Number
1
Coded by
Verified by 2
3
ARM Boat Number 4
ARM Victim Number 5
6
State 7
Month 8
Year 9
Time 10
Boat Length Ft. 11
Number P.O.B. 12
Number PFDs on board 13
Juriddiction 1 = state only 14
Accident Type 2 = joint 15
Boat Type
Activity 16
Body of Water 17
Distance to Shore/Vessel 18
Assisting Party 19
Victim's Sex M=1 F=2 20
Age A=1 T=2 C=3 21
22
Final Boat Configuration 23
24
Level Flotation Boat? Y=1 N=2 25
Victim's Condition
Health 26
Behavior/Circumstances 27
Time In/With Boat 28
PFD Available/Use 29
Time Till PFD Donned/Removed 30
Sufficient PFDs on board? Y=1 N=2 31
PFD Type (No "99's" here, use 09) 32
PFD Malfunction? Y=1 N=2 33
Improper PFD Use? Y=1 N=2 34
Distress Notification 35
Water Temperature °F 36
Time in Water 37
Water Condition 38
Outcome R=1 F=2 39
Hull I.D. #: 1=known 8=UNK 40
Year of Manuf. (last 2 digits) 41
42
No. of Type I PFDs aboard 43
No. of Type II PFDs aboard 44
No. of Type III PFDs aboard 45
No. of Type IV PFDs aboard 46
No. of Type V PFDs aboard 47
No. of Unapproved PFDs aboard 48
9=8 or more
No. of PFDs of unk. type aboard 49
Type of Power 50
Alcohol 51

1. Wyle or BAR Number.

   This is the number used to relocate the BAR (if needed again in the future). For the 1977 data, this number is 77xxxx, where the "77" indicates it was part of the data put into ARM in 1977, the first "x" is the batch number, and the last three "x's" are the accident number within the 1977 sample. Thus, 772029 would be the 29th accident report used in the 1977 sample, and it was processed as part of the second batch.

2. Coded by:

   1 = Stuart Bernell; 2 = Benny Smith; 3 = Chris Stiehl
   11 = Mark Perry; 12 = Anne Baune; 13 = Gay Parrott
   14 = Olivia Corder

3. Verified by:

   Verification is the process by which one coder inspects the coded work of another to determine if he agrees with those codes. Once the coders agree, and have verified each other's work, then one of the codes listed under #2 above is used here to indicate this verification.

4. Leave blank; this variable is going to be deleted.

5. ARM boat number:

   This is the boat number in this accident. For almost all accidents except collisions, this will be "01." For collisions, this variable allows us to separate victims from each vessel, so when you start coding victims from the second vessel, enter "02" in this variable. For additional vessels in the same accident, use "03," etc.

6. ARM victim number:

   This is the number of the victim within this vessel. When you move on to the next vessel (accident), start renumbering victims.

7. Leave blank; this variable will be deleted.

8. State:

Alabama	01	Alaska	02	Arizona	04
Arkansas	05	California	06	Colorado	08
Colorado	08	Connecticut	09	Delaware	10
Dist. of Columbia	11	Florida	12	Georgia	13
Hawaii	15	Idaho	16	Illinois	17
Indiana	18	Iowa	19	Kansas	20
Kentucky	21	Louisiana	22	Maine	23
Maryland	24	Massachusetts	25	Michigan	26
Minnesota	27	Mississippi	28	Missouri	29
Montana	30	Nebraska	31	Nevada	32
New Hampshire	33	New Jersey	34	New Mexico	35
New York	36	North Carolina	37	North Dakota	38
Ohio	39	Oklahoma	40	Oregon	41
Pennsylvania	42	Rhode Island	44	South Carolina	45
South Dakota	46	Tennessee	47	Texas	48
Utah	49	Vermont	50	Virginia	51
Washington	53	West Virginia	54	Wisconsin	55
Wyoming	56				

NOTE: FOR ALL VARIABLES, UNKNOWN IS CODED AS 8 (1-digit variable) OR 88 (2-digit variable). ALWAYS RIGHT-HAND JUSTIFY THE CODES.

9. Month: January = 01; February = 02, etc. Unknown = 88

10. Year: Code the last two digits of the year. Unknown = 88

11. Time: Code two digits (in military time: i.e., 00-24 hours) corresponding to the time that the accident began. Code the time of the capsizing, for example, when a boat capsized and the people are not recovered for 10 hours, code it at 10 hours. Round the time up on or past the half hour, i.e., if the accident happened at 9:30 p.m., code it 22; 9:35 p.m. = 22 also. Unknown = 88.

12. Boat Length:

Code the boat length as a two-digit number, to the nearest foot. If the length of the boat is given as 14' 6", code it as 15'. Round up to the nearest foot. Anything over 6" is also rounded up to the next nearest foot. NOTE: For accidents where the only person (people) actually involved in the accident was not aboard a boat, code for the appropriate boat. For falls overboard, this would be the boat that they left. For hit by the boat or prop, this would be for the boat that did the hitting, whether this victim had anything to do with that boat before he was hit or not. The same logic applies to all "boat data." Code unknown = 88.

13. Number of P.O.B. (people on board):

Code the number of people on board the appropriate boat as a two-digit number. For accidents involving only a person in the act of water skiing, code only the skier. List the number of POB as the total people on board that boat (including the skier(s)). When the accident type is "struck by the boat or prop," or some "others," and the person that was struck (involved) was not a passenger on the striking boat (involved boat), code the POB as "99" for this person. If any additional people are involved in the accident (e.g. the people on the striking boat), then code the POB for the boat that corresponds to each individual. Code unknown = 88.

14. Number of PFDs on board:

Code this as a two-digit number for the appropriate boat. Code unknown = 88.

15. Jurisdiction:

1 = state only; 2 = joint jurisdiction

If jurisdiction is not stated, and the BAR is a Coast Guard BAR or on Coast Guard letterhead, code 02. If the BAR is not an official CG BAR or on Coast Guard letterhead, code 01.

16. Accident Type:

Code the primary (first) accident type. For example, if there is a collision, causing someone to fall out of the boat, that person is coded as a victim of a collision, not a fall overboard. Similarly, if a person on a johnboat falls overboard, causing the boat to capsize, throwing another person into the water, both victims are coded as falls overboard, since that was the primary cause of the accident. Sometimes more than one accident happens consecutively in time. For example, a person could fall overboard and another person coming to his aid might be hit by a boat or prop. In this case, the second victim would be coded as hit by the boat or prop and the two individuals would be coded as victims of separate accident types under the same accident number. Many of these types of accidents will require judgment, and the other analysts should be consulted if there is any doubt.

1 = Collisions/groundings
2 = Swampings/capsizings/floodings/sinkings
3 = Fires and explosions
4 = Falls overboard
5 = Struck by boat or propeller
6 = Other
8 = Unknown

17. Boat Type:

1 = Open/manual (not canoe)
2 = Open/power
3 = Cabin motorboat
4 = Sail + auxiliary sail
5 = Canoe and kayak
6 = Houseboat
7 = Inflatable
8 = Other
9 = Unknown

18. Activity:

This is the activity at the time of the accident. Water skiing includes the boat, skier, maneuvering to pick up the skier, etc.

1 = Pleasure cruising
2 = Fishing
3 = Hunting
4 = Water skiing
5 = Skin diving or swimming (not underway)
6 = Stopped, reason unknown or not one of the above
7 = Racing
8 = Unknown
0 = Other (docking, etc.)

19. Body of Water:

1 = River, creek, etc.
2 = Lake (other than GL), swamp, etc.
3 = Great Lake
4 = Coastal bay, inlet, sound, harbor, waterway, etc.
5 = Ocean
8 = Unknown

20. Distance to Shore or Another Vessel:

Code for whichever distance is shorter (to shore, or to the nearest vessel). For a collision (or any other accident) code the distance to the nearest other boat (one not involved in the accident) if it is shorter than the distance to shore.

1 = 0 - 5 yards
2 = 5 - 300 yards (1/6 mi)
3 = 300 yards (1/6 mi) - 1/2 mi
4 = 1/2 mi - 2 mi
5 = Greater than 2 miles
8 = Unknown

21. Assisting Party:

1 = Boater from same boat
2 = Boater from another boat
3 = USCG
4 = CG Auxiliary
5 = State or local officials
6 = No one
7 = Other
8 = Unknown

22. Victim's Sex: 1 = male; 2 = female; 8 = Unknown

23. Age: 1 = Adult (over 18); 2 = Teenager (12-18); 3 = Child (under 12)

If the age is unknown, but the BAR infers that the person is an adult, i.e., married, Mr., Mrs., etc., code as an adult. Use the same logic for teenagers and children.

24. Final Boat Configuration:

Use the decision tree for this variable to find the appropriate code. Read down the tree as far as the information available will allow. For example, if the final configuration was known to be upright and not swamped, but it was not known if the boat was still propelled, code "21." A sailboat that can still sail is coded "1."

For boats which were swamped, capsized, or flooded, presure that the boat was NOT level unless stated otherwise. "Propelled" means actually underway, NOT "propellable."

25. Level Flotation Boat: 1 = Yes; 2 = No

This question does not refer to whether the boat actually floated level or not, but to whether it was level flotation equipped. If not mentioned, it should be coded "NO;" this variable should never be coded "unknown."

26. Victim's Condition:

Use the decision tree for this variable to find the appropriate code. As before, read down the tree as far as the available information will permit and enter the corresponding code. A "swimmer" is anyone who can swim at all. If the emergency treatment that is given is equivalent to, or better than, that that would be given by someone who had had one course in first aid (high school, etc.), then it is considered "adequate." If the treatment is less than that, or none at all, then it is "inadequate."

If there is no evidence of ill health or injury during the accident, use the "not seriously injured" branch. Adequate emergency treatment means that which could be administrerd by a graduate of the standard short course given by the Red Cross.

27. Health:

1=Good health (use this if unknown)
2=History of heart trouble or known to have occurred in this accident
3=Other poor health

28. Behavior/Circumstances:

Use the decision tree to find the appropriate code. Again, proceed through the tree only as far as the information allows, and write the corresponding code. Note that a victim who falls out of a boat and re-enters it is NOT coded under "in boat," but under "in water not trapped or entangled." Although his eventual position is in the boat, the code "4" more accurately described his behavior. Therefore review the entire chart once you have chosen your code, to make sure that you have chosen the best descriptor. For this decision tree, moving down the tree corresponds to moving forward in time through the events and actions of the accident. The boxes on the path of the tree that have been chosen should describe the victim's behavior and circumstances in sequence.

- Falls Overboard - Starts in the water
- Capsizing - Starts in the water
- Collision - Starts in the boat (unless the victim is thrown out of the boat immediately upon impact. If this occurs, start the victim in water.
- Swamping - Starts in the boat

If the victim winds up in neither the boat nor the water (on shore, on a dock, etc.) then code "99." Presume that the victim remained in the water (22) if the available information does not indicate that he re-entered the boat. Presume that the victim "fell or was thrown out, etc." (10) or "abandoned boat due to fire, etc." (3) if it is not known or mentioned that he swam for shore or another source of flotation, but it is known that he (she) was separated from the boat.

29. Time In/With Boat:
31. Time Until PFD Donned or Removed: (if unknown if victim used a PFD code 88=UK).
38. Time in Water:

For each of these variables, use the codes listed below. All of these times are the total time from the beginning of the accident until recovery or death (variables 29 and 38), or until the PFD is donned or removed (variable 31). For any of these, if the variable is not applicable to the person (time to donning, for example, is not applicable if the person never dons a PFD), then use "99" = not applicable. If a victim exited and re-entered the boat several times, time in or with the boat is the sum of these separate times. Similarly, time in water is summed.

1 = 0 - 2 min.
2 = 2 - 5 min.
3 = 5 - 15 min.
4 = 1/4 - 1/2 hr.
5 = 1/2 - 1 hr.
6 = 1 - 1½ hr.
7 = 1½ - 2 hr.
8 = 2 - 3 hr.
9 = 3 - 4 hr.
10 = 4 - 5 hr.
11 = 5 - 10 hr.
12 = > 10 hr.
88 = Unknown

30. PFD Availability and Use:

Use the decision tree to find the appropriate code, reading down the tree as far as the available information permits. Note the codes for people who have an accident and then remove or don a PFD after the accident has begun or happened. In these cases, the time to removal or donning should also be recorded as variable 31.

"Took PFD off..." (11) refers only to voluntary acts. If the victim slipped out of the PFD, or the waves ripped it off of him (her), it should be coded as "Did not take PFD off" (1). If unknown if victim used PFD, code 88 = unknown.

31. See 29 above.

32. Sufficient PFDs on Board:

This question refers to any time of PFD. If the question concerning sufficient CG approved PFDs is checked "yes" on the BAR, then this should be coded 1 = "yes" for ARM. It should also be coded "1" if there were sufficient PFDs aboard, even though some of them may not have been CG approved.

33. PFD Type:

Code PFD type for each victim. Use the decision tree to find the appropriate code. Note that those victims without any type of flotation aid are coded as "09" and unknowns are "88".

34. PFD Malfunction:

Code a "1" = yes if the PFD did not perform properly. If it is an inflatable, it may have had a leak, or not inflated. If a buckle didn't work, or a strap broke on a PFD, that would be a malfunction, etc. If unknown if victim used a PFD, code 88 = unknown.

If victim used PFD and no malfunction is mentioned, assumed no (02). If you know he did not have one on (or use one), then code = 99.

35. Improper PFD Use:

Code a "1" - yes if the person used the PFD improperly. For example, if a cushion was worn on a person's back, that would be improper use. Again, suspicion = 88. Unknown = "no" - assume proper use unless stated otherwise. If you know he did not have one on (or use one), then code = 99. No = 02.

43. Number of PFDs Aboard of Type I ______ - 0 = None

44. Number of PFDs Aboard of Type II ______

45. Number of PFDs Aboard of Type III ______

46. Number of PFDs Aboard of Type IV ______

47. Number of PFDs Aboard of Type V ______

48. Number of Unapproved PFDs Aboard ______ - 0 = None

49. Number of Unknown Type PFDs Aboard ______ - 0 = None

Code the number of PFDs aboard of each type, in the order specified on the coding sheet. The "8" for unknown, and use "9" for eight or more PFDs.

50. Type of Power:

0 = Other
1 = Outboard
2 = I/O
3 = Inboard
4 = Sail only
5 = Auxiliary sail
6 = Sail, but unknown if auxiliary
7 = Jet drive
8 = Unknown
9 = Manual

51. Alcohol:

1 = This person was known to have been drunk (autopsy, etc).
2 = This person was known to have been drinking
3 = Drinking suspected (some evidence, other person said so, etc)
4 = Known that this person wasn't drinking (autopsy, etc)
5 = No mention of alcohol, or unknown
6 = Other drug definitely present (autopsy, etc)

FINAL NOTES:

Be sure to right justify all codes. A "9" is coded "09" for a two-digit variable, etc.

IF YOU CODE ANYTHING AS "UNKNOWN" or "NOT APPLICABLE," BE SURE TO READ THIS:

The code corresponding to UNKNOWN is NOT PERMITTED for the following variables:
25 26 27 36

The code corresponding to NOT APPLICABLE is permitted ONLY for the following variables:
13 28 31 34 35 36 38

36. Distress Notification:

Use the decision tree to find the proper code. Be sure to note the definitions on the same sheet as the tree.
Code 13 is used if the boat and equipment is observed after the accident by someone other than the victims.
Code 12 is used when the victims use a makeshift signal device, e.g., PFD tied to boat paddle, smoke signals.
Code 11 is used when signal is made by radio communications, flare gun, signal flag, flashlight, etc.
99 - is used when no distress signal is necessary, e.g. partially swamped boat is evacuated of water and resumes normal operation, and hit and "runners" are examples. Coder must obtain approval from N. Whatley or C. Stiehl before using code 99.

37. Water Temperature:

Code the two digits most closely corresponding to the water temperature in °F. For water temperatures of 87 or more, use "87," and don't use any codes above 87 except "88" for unknown.

38. See #29 on previous page.

39. Water Condition:

1 = Calm
2 = Choppy/Rough
3 = Swift Current
8 = Unknown - if water conditions are unknown but BAR states that water conditions are not a factor in this accident, assume calm.

40. Outcome:

If the victim survived the accident, he/she is a recovery = "1." Otherwise, use "2" for victims who die and "8" if the outcome is unknown.

41. Hull Identification Number:

If the HIN is known, or if the Federal Boat Documentation Number is known, code "1," code "8" otherwise. (If the HIN does not contain 12 consequent digits, reference FR 181.25, then code 8.)

42. Year of Manufacture:

Code the last two digits of the year that the boat was manufactured (model year). 88 = unknown

§ 181.25 Hull identification number format.

Each hull identification number required by § 181.23 must consist of 12 characters as follows:

(a) The first three characters must consist of a manufacturer identification assigned under § 181.31.

(b) Characters 4 through 8 must be assigned by the manufacturer and must be letters of the English alphabet or Arabic numerals or both, except the letters I, O, and Q.

(c) Characters 9 through 12 must indicate the date of certification. The characters must be either—

(1) Arabic numerals with characters 9 and 10 indicating the month and characters 11 and 12 indicating the last two numerals of the year; or

(2) A combination of Arabic numerals and letters of the English alphabet with character 9 indicated as "M," characters 10 and 11 the last two numerals of the model year, and character 12 the month of the model year. The first month of the model year, August, must be designated by the letter "A," the second month, September, by the letter "B," and so on until the last month of the model year, July.

§ 181.27 Additional characters in hull identification number.

A manufacturer may display additional characters after the 12 characters required by § 181.25 if they are separated from the hull identification number by a hyphen.

§ 181.29 Hull identification number display.

(a) The hull identification number must be carved, burned, stamped, embossed, or otherwise permanently affixed to the outboard side of the transom or, if there is no transom, to the outermost starboard side at the end of the hull that bears the rudder or other steering mechanism, above the waterline of the boat in such a way that alteration, removal, or replacement would be obvious and evident.

(b) The characters of the hull identification number must be no less than one-fourth of an inch in height.

§ 181.31 Manufacturer identification assigned.

(a) Each person required by § 181.23 to affix a hull identification number may request a manufacturer identification from the Commandant (GBBC), 400 Seventh Street SW., Washington, DC 20590. There is no charge for the assignment.

Effective date. This amendment shall become effective on November 1, 1972.

Dated: July 27, 1972.

Types of Personal Flotation Devices

Type I—

A Type I PFD is any approved wearable device designed to *turn* an unconscious person in the water from a face down position to a vertical or slightly backward position, and to have more than 20 pounds of buoyancy. Recommended for offshore cruising.

Type II—

A Type II PFD is any approved wearable device designed to turn an unconscious person from a face down position to a vertical or slightly backward position and to have at least 15.5 pounds of buoyancy. Recommended for closer inshore cruising.

Type III—

A Type III PFD is any approved wearable device designed to keep a *conscious* person in a vertical or slightly backward position and to have at least 15.5 pounds of buoyancy. While the Type III has the same buoyancy as the Type II PFD, it has a less turning moment. It does, however, allow greater wearing comfort and is particularly useful when water skiing, sailing, hunting, or engaged in other such water sports. It is recommended for use on lakes, impoundments, and close inshore operation.

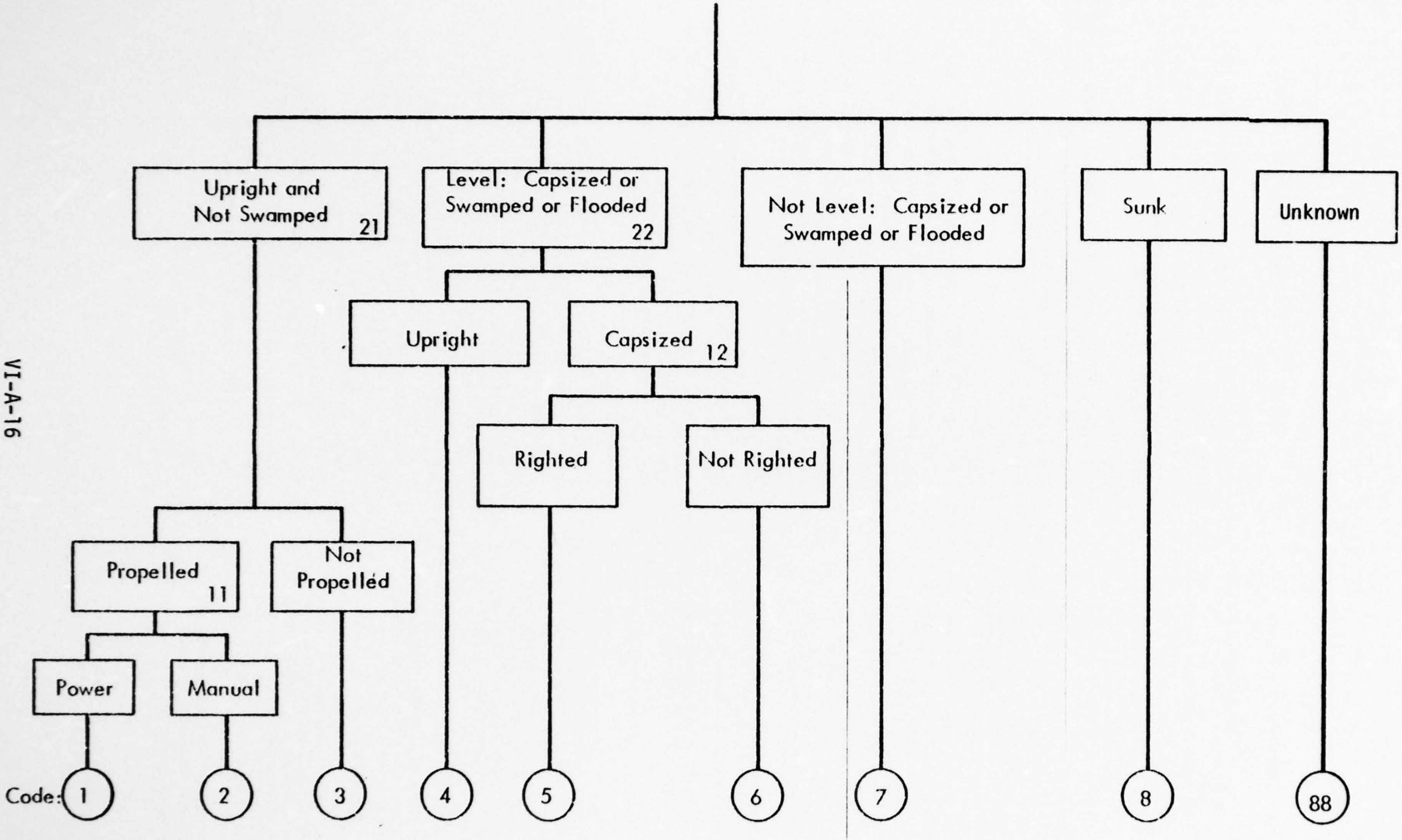
Type IV—

A Type IV PFD is any approved device designed to be *thrown* to a person in the water. It is *not* designed to be worn. It is designed to have at least 16.5 pounds of buoyancy. The most common Type IV device is a buoyant cushion. A ring buoy is also a Type IV device.

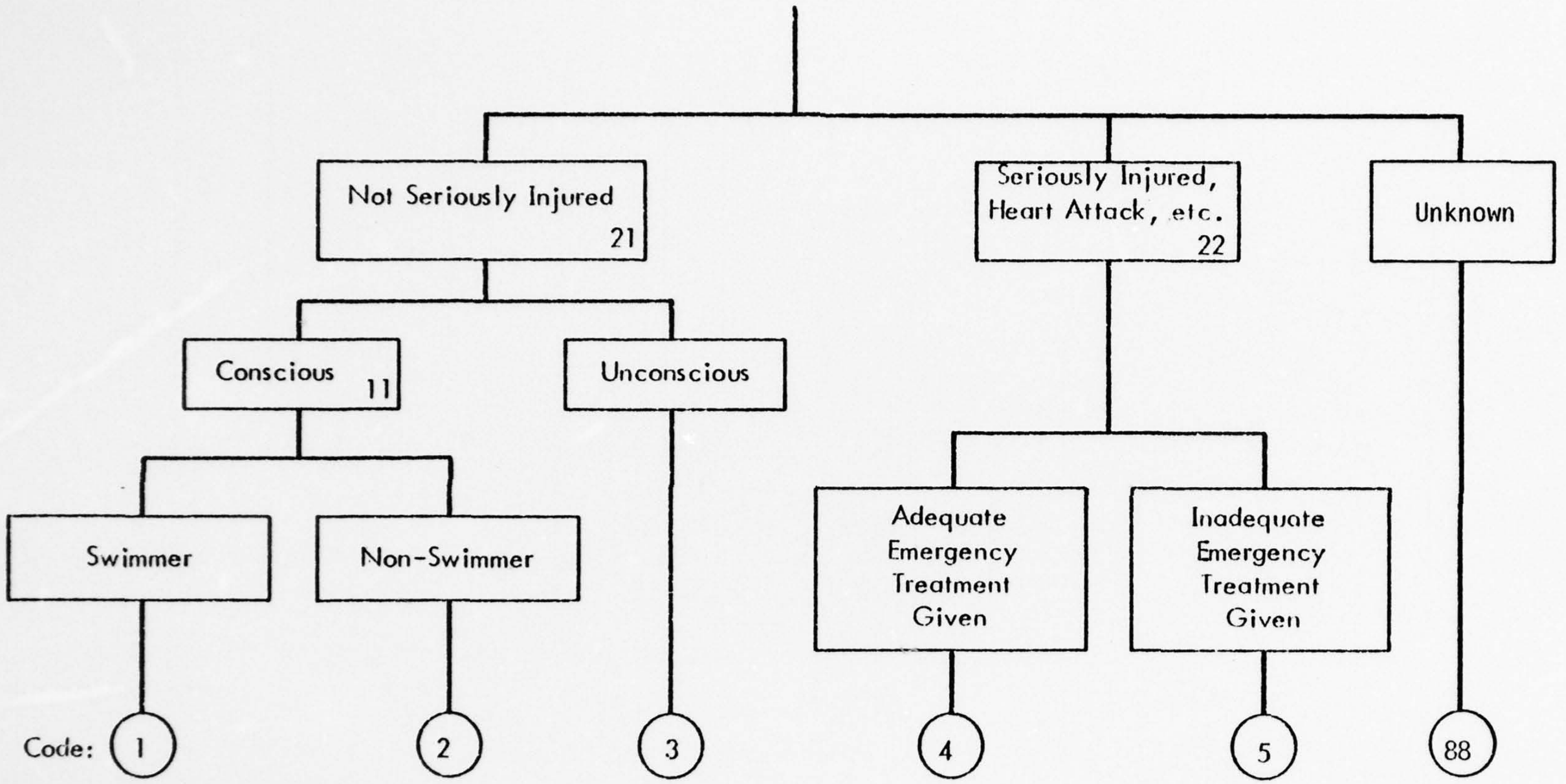
Type V—

A Type V PFD is any approved wearable device designed for a specific and restricted use. The exact specifications and performance of a Type V PFD will vary somewhat with each device. THE ONLY PRESENTLY APPROVED DEVICE THAT FALLS INTO THE TYPE V DESIGNATION IS THE "WORK VEST". THIS IS A DEVICE DESIGNED AND MARKED SPECIFICALLY FOR USE BY PERSONS WORKING AROUND MERCHANT VESSELS.

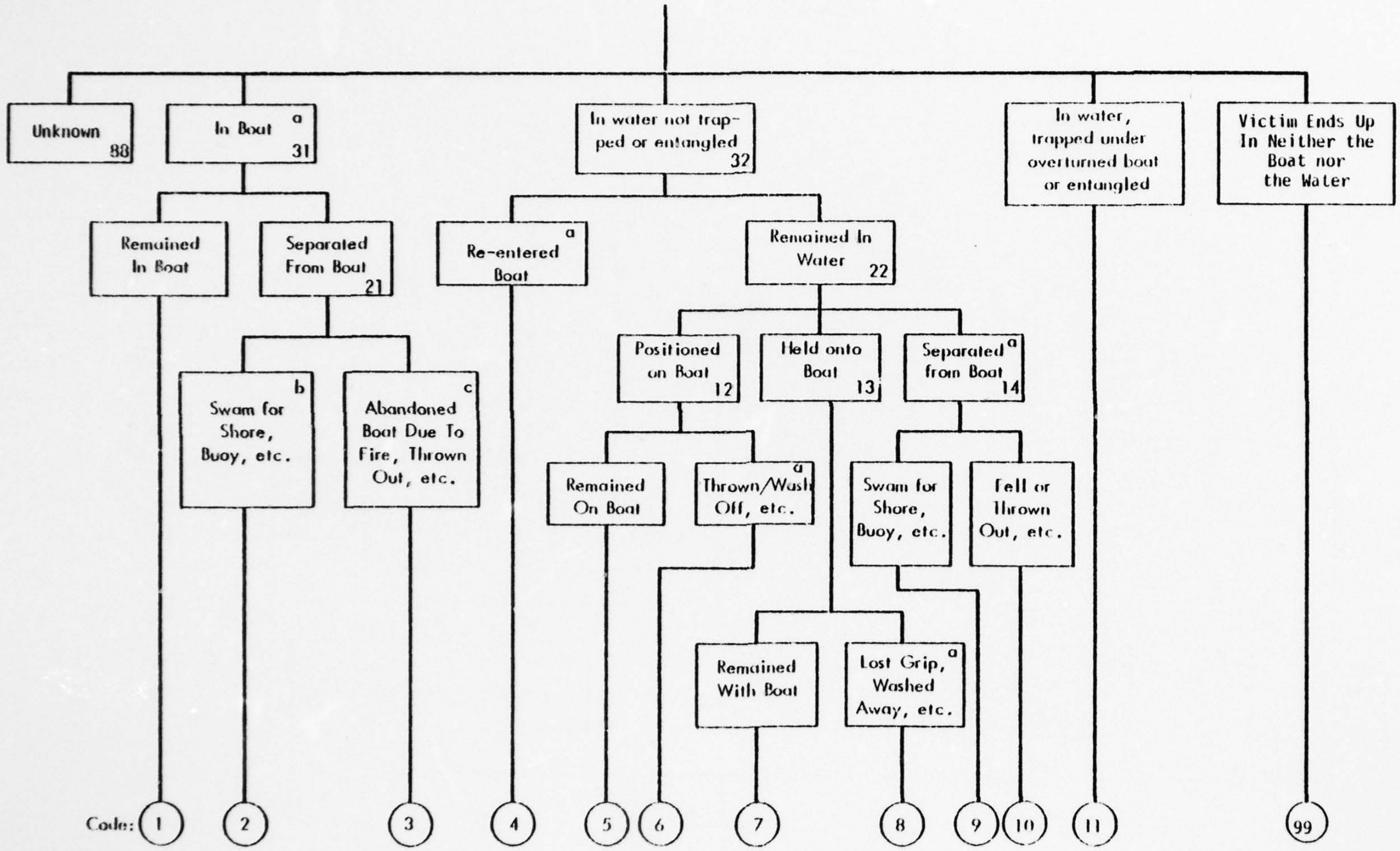
ALL PERSONAL FLOTATION DEVICES (PFD'S) THAT ARE PRESENTLY ACCEPTABLE ON RECREATIONAL BOATS FALL INTO ONE OF THE FIRST FOUR TYPE DESIGNATIONS. ALL WEARABLE PFD'S SHALL BE U.S. COAST GUARD APPROVED, READILY ACCESSIBLE, IN SERVICEABLE CONDITION, AND OF AN APPROPRIATE SIZE FOR THE PERSON WHO INTENDS TO WEAR IT. TYPE IV DEVICES MUST BE IMMEDIATELY AVAILABLE.


Upright and Not Swamped 21
Level: Capsized or Swamped or Flooded 22
Not Level: Capsized or Swamped or Flooded
Sunk
Unknown
Upright
Capsized 12
Righted
Not Righted
Propelled 11
Not Propelled
Power
Manual
Code:
1
2
3
4
5
6
7
8
88

ARM DECISION TREE FOR FINAL CONFIGURATION OF BOAT (VARIABLE 24)


Not Seriously Injured
21
Seriously Injured, Heart Attack, etc.
22
Unknown
Conscious
11
Unconscious
Swimmer
Non-Swimmer
Adequate Emergency Treatment Given
Inadequate Emergency Treatment Given
Code:
1
2
3
4
5
88

VICTIM'S CONDITION (VARIABLE 26)


Unknown 88
In Boat a 31
In water not trapped or entangled 32
In water, trapped under overturned boat or entangled
Victim Ends Up In Neither the Boat nor the Water
Remained In Boat
Separated From Boat 21
Re-entered Boat a
Remained In Water 22
Swam for Shore, Buoy, etc. b
Abandoned Boat Due To Fire, Thrown Out, etc. c
Positioned on Boat 12
Held onto Boat 13
Separated from Boat a 14
Remained On Boat
Thrown/Wash Off, etc. a
Swam for Shore, Buoy, etc.
Fell or Thrown Out, etc.
Remained With Boat
Lost Grip, Washed Away, etc. a
Code:
1
2
3
4
5
6
7
8
9
10
11
99

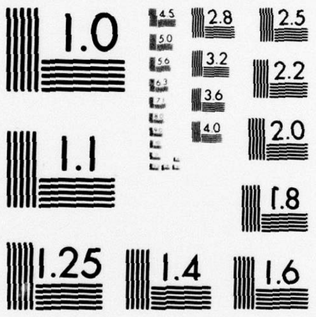
a - Code in or with boat after accident as variable 29. b - voluntarily left boat. c - involuntarily left boat.

VICTIM'S BEHAVIOR AND CIRCUMSTANCES (VARIABLE 28)

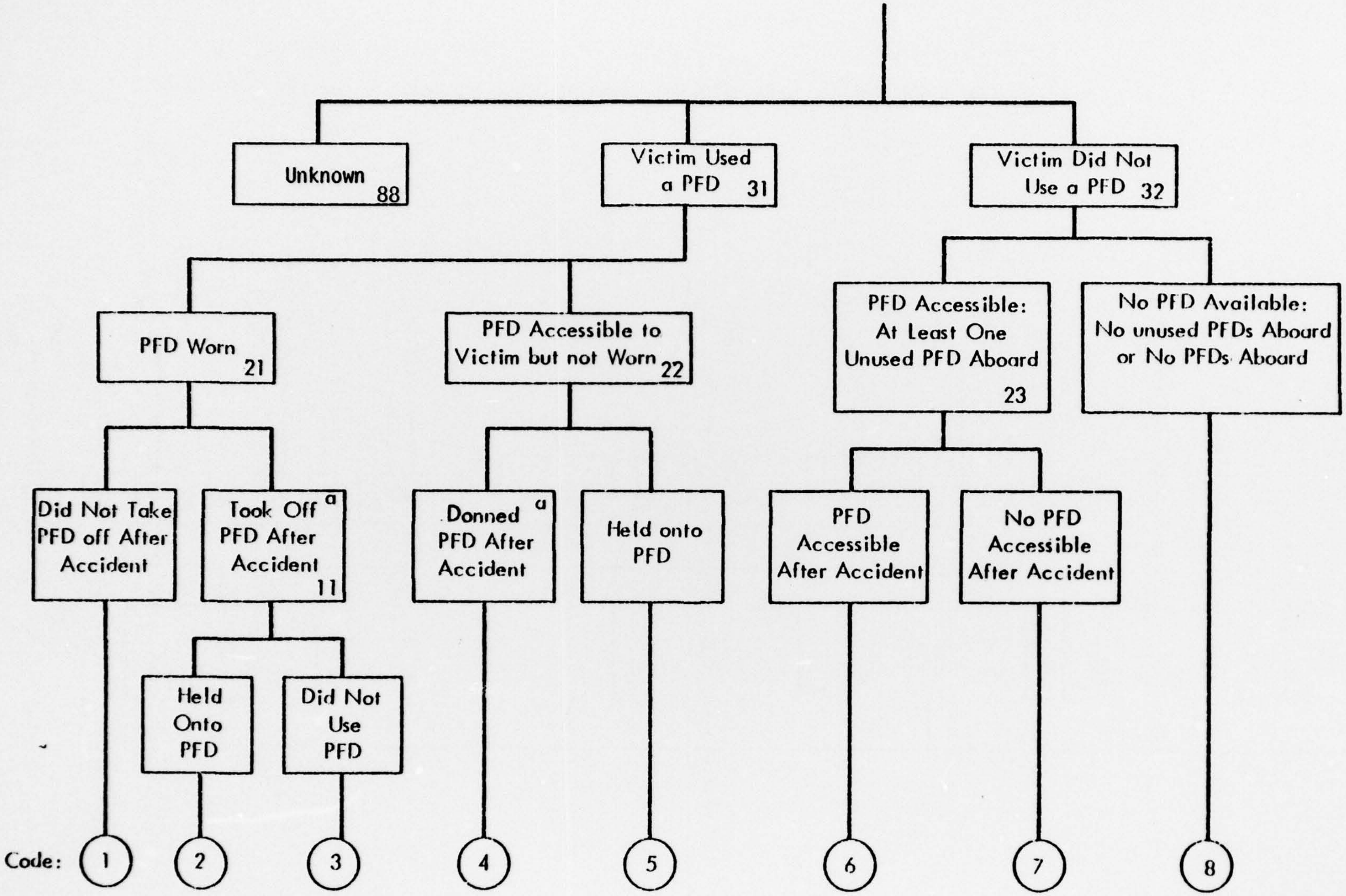
AD-A058 739 WYLE LABS HUNTSVILLE ALA F/G 6/7
PERSONAL FLOTATION DEVICES RESEARCH. VOLUME 3. APPENDICES.(U)
JAN 78 T DOLL, M PFAUTH, J GLEASON, S COHEN DOT-CG-42333-A
UNCLASSIFIED MSR 78-1-VOL-3 USCG-D-41-78-VOL-3 NL

4 OF 4
AD
A058739

END
DATE
FILMED
11-78
DDC

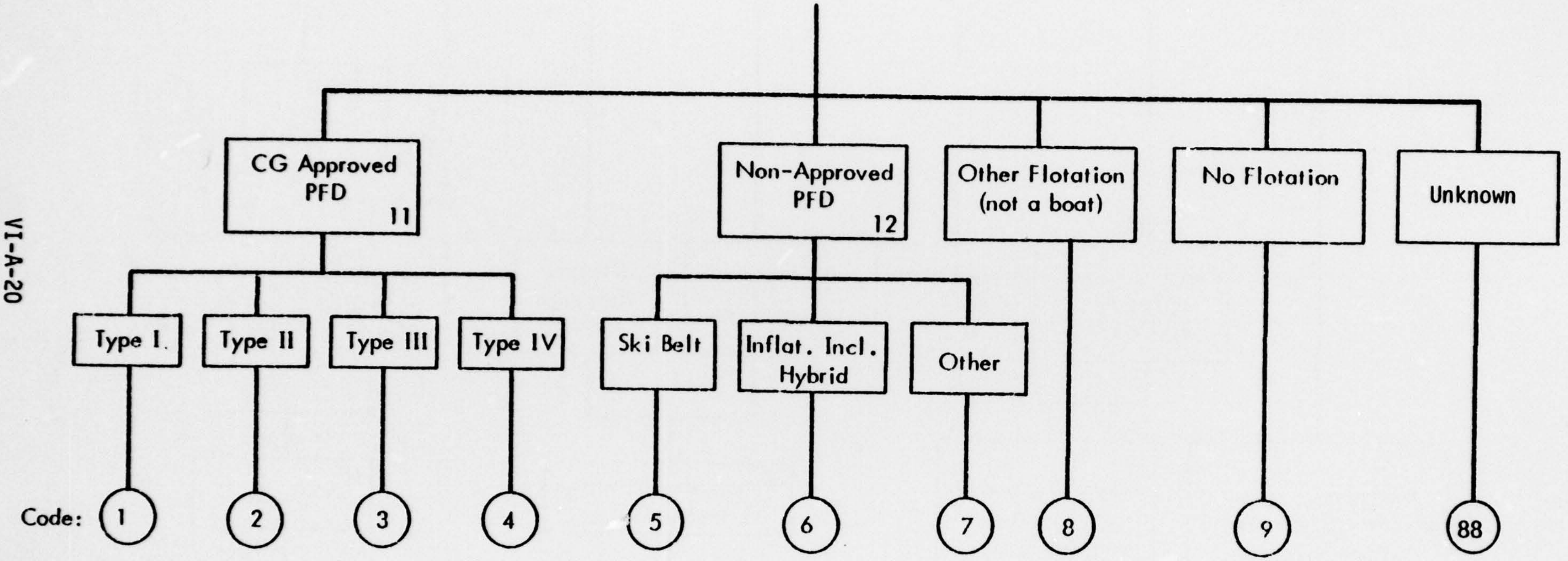

1.0
4.5
5.0
5.6
6.3
2.8
2.5
3.2
2.2
3.6
4.0
2.0
1.1
1.8
1.25
1.4
1.6

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A


Unknown 88
Victim Used a PFD 31
Victim Did Not Use a PFD 32
PFD Worn 21
PFD Accessible to Victim but not Worn 22
PFD Accessible: At Least One Unused PFD Aboard 23
No PFD Available: No unused PFDs Aboard or No PFDs Aboard
Did Not Take PFD off After Accident
Took Off a PFD After Accident 11
Donned a PFD After Accident
Held onto PFD
PFD Accessible After Accident
No PFD Accessible After Accident
Held Onto PFD
Did Not Use PFD
Code:
1
2
3
4
5
6
7
8

a - Code time until PFD was donned or taken off as variable 31.

PFD AVAILABILITY AND USE (VARIABLE 30)


CG Approved PFD
11
Non-Approved PFD
12
Other Flotation (not a boat)
No Flotation
Unknown
Type I.
Type II
Type III
Type IV
Ski Belt
Inflat. Incl. Hybrid
Other
Code:
1
2
3
4
5
6
7
8
9
88

TYPE OF PFD, IF ANY, USED BY VICTIM (VARIABLE 33)

302

302

SECTION VI

THE ACCIDENT RECOVERY MODEL

- APPENDIX VI-A. ARM Analyst's Guide
- APPENDIX VI-B. Theoretical Exploration of Extreme LSI Values
- APPENDIX VI-C. Example Contingency Tables Used in Selecting C-Variables for Use in Multistate Benefit Calculations